International Rock Gardener

ISSN 2053-7557



Number 202 The Scottish Rock Garden Club November 2026

---International Rock Gardener---

2026



There have been many difficulties with this issue of IRG. I have been and am still, unwell, and my laptop has been similarly "difficult" in sympathy with me!
Dr Rukšāns, and Dr Zubov have been very patient, understanding and helpful, through these very trying times and have offered help beyond expectation.
For this I thank them most sincerely: Margaret Young, Editor.

In the similar vein, I offer apologies for the error on the cover of IRG On Climate Change by DecemberDr Huntley, which should have given the original publication date as 2025.

I have also had a note from Ethan Hamilton, of KyrgyzstanPlanner.com to say he had noticed in IRG 169), particularly the Sary-Chelek's ranking among Kyrgyzstan's lakes, two gographical details that may be worth reviewing.

He writes "The article describes Sary-Chelek as the fourth-largest lake in Kyrgyzstan. However, its surface area is approximately 4.9 km², making it considerably smaller than many other lakes in the country. The three largest by surface area are Issyk-Kul, Son-Kul and Chatyr-Kul. Sary-Chelek is notable for its depth and exceptional natural setting, rather than its surface-area ranking.

Winter water temperature:The article mentions winter water temperatures reaching −4°C. This seems to require clarification, as such a temperature would not be physically plausible for ordinary liquid freshwater in the lake. Perhaps the original figure referred to air temperature rather than water temperature.I maintain a source-traceable geographical dataset covering 73 lakes in Kyrgyzstan, including published measurements, elevations and references: **https://kyrgyzstanplanner.com/lakes-of-kyrgyzstan** The compilation may be useful for checking these details and for future articles covering the country's mountain landscapes. Thank you for your work documenting Kyrgyzstan's mountain flora and landscapes. Best regards, Ethan Hamilton."

Cover image: Colchicum breviantherum photo J.R

"Champagne makes you feel like it's Sunday and better days are just around the corner."

....quote after hard times, from Marlene Dietrich !!

---International Rock Gardener---

--- Species Descriptions ---

Two new *Colchicum* species of the *C. robustum* complex (Colchicaceae) from the foothills of the Kopet Dag Mountains

Dimitri Zubov, Ph.D. in Biology, Ukraine
https://orcid.org/0000-0002-3134-2594; zubovilaya@gmail.com

Jānis Rukšāns, Dr. biol., Latvia; janis.bulb@hawk.lv

Summary. *Colchicum breviantherum* and *C. khorassanicum* (Colchicaceae), two new spring-flowering ephemeroid species with synanthous leaves and split to the base tube of perianth from the *C. robustum* complex, endemic to the Kopet Dag Mountains (Iran, Turkmenistan), are described and illustrated. Morphological differences between the new species and other related species are discussed. Photographs, figures (habitat and morphology), a distribution map, and a preliminary informal conservation assessment are provided. The Addendum provides a new taxonomic status and a detailed description of the Ingush *Colchicum* distributed in Central & Eastern Caucasus.

Key Words. *Colchicum*, geophyte, synanthous, corm, flora of the Kopet Dag (Turkmen-Khorasan) Mountain Range, flora of the Caucasus, sibling species, cryptic species, co-occurring species, species complex.

The most taxonomically difficult and poorly studied group of colchicums is the *Colchicum robustum* complex [6, 9-11, 13]. Currently, the following species are generally accepted: with an entire tube of perianth – *C. luteum* Baker, in Gard. Chron. ser. 2, 2: 34 (1874), *C. kesselringii* Regel, in Trudy Imp. S.-Peterburgsk. Bot. Sada 8: 646 (1884), and their several polymorphic natural hybrid races, occurring at the junction of two species and currently considered as *C.* × *alberti* Regel, in Trudy Imp. S.-Peterburgsk. Bot. Sada 8: 647 (1884) [9-11]. The following species with a split to the base tube of perianth are distinguished: *C. robustum* (Bunge) Stef., in Sborn. Bălg. Akad. Nauk., Klon Prir.-Mat. 22: 24 (1926), but in a rather broad sense with a huge distribution range from Iran to Pakistan, including the countries of Central Asia. Thereof, allopatric geographical races of *C. robustum* aff. with a split to the base tube of perianth distributed in Iran or in Pakistan and separated by thousands of kilometers and numerous orographic objects and watersheds are unlikely to be morphologically and genetically the same species. Therefore, we would recommend considering such a group of either sibling or cryptic species in a very broad sense as the *C. robustum* (Stefanov 1926: 24) [13] complex. Also, in 2025, we described a new species with a split tube from this complex – *C. talassicum* Lazkov & Zubov, Kew Bull. 80(4): 923 (2025) from Kyrgyzstan [6].

However, according to the authors' field observations, within a given population, morphologically significant characters are still more or less constant (e.g., mature corm shape and size, corm tunic texture, leaves size and type of stem – leaf orientation at fruiting, anther length, shape of the capsules and seeds), which allows to reliably distinguish allopatric populations and even syntopic populations of the co-occurring species within the *Colchicum robustum* complex. For example, a significant morphological characteristic is the structure of the corm tunic in colchicums. They can be coriaceous (*leathery*) to subcoriaceous, like in *C. trigynum* (Steven ex Adams) Stearn, *C. burttii* Meikle, *C. atticum* Spruner ex Tommas., *membranous*, like in *C. szovitsii* Fisch. & C.A.Mey., *C. ghalghanum* (Otsch.) Zubov & Rukšāns comb.nov. (see Addendum), *C. bulbocodium* Ker Gawl., and papery, like in *C. triphyllum* Kunze, *C. raddeanum* (Regel) K.Perss., *C. lagotum* K.Perss. This key character allows distinguishing reliably the sibling species within the genus *Colchicum* L., especially if they are co-occurring species (e.g., *C. trigynum vs C. ghalghanum; C. kurdicum* (Bornm.) Stef. *vs C. raddeanum*) [15].

A poorly studied Asian region where representatives of this complex grow in abundance is northern and northeastern Iran. In this region, we collected several *Colchicum* specimens from Qom to Bojnurd, Raz (Alborz, Aladagh, and Kopet Dag Mountains) during fieldwork in different years (2008 – 2025). Those in *situ* observed plants were different in a number of features. The following synapomorphies are characteristic of the entire *C. robustum* complex: 4 – 11 leaves, a split perianth tube, and multiple hypogynous flowers (1 – 6), *anthers* basifixed, rigid, linear, twisted at dehiscence, sagittate at base, *nectary* at filament base pronounced, swollen, *styles* 3, free, filiform, ovary underground, sessile, superior, the corm tunics are coriaceous (leathery) to varying degrees to membranous, *juvenile and seedling* corms markedly elongated, digitiform, capsule trigonous, beaked, dehiscent, open from the top and disconnect septicidally in upper third, seeds strophiolate, multiple in capsule, globose to subglobous and ovoid, with smooth, dull-reddish, light-brown to dark-brown testa, small strophiole from the micropyle side and a noticeable meridional pale coloured thread-like raphe extending from the micropyle to the chalaza areas.

The *Colchicum robustum* isotype specimen LE00054995! is housed in LE herbarium (≡ *Merendera robusta* Bunge, Beitr. Fl. Russl., Mém. Sav. Étrang. Acad. Pétersb. 7: 339 (1852, preprint), 515 (1854) ≡ *Bulbocodium robustum* (Bunge) Regel, in Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 491 (1879). Karin Persson also proposed the following *C. robustum* lectotype specimen from the authentic collection of A. Lehmann: Uzbekistan/ Kazakhstan, 'Im Sande bei Nasarbai Chuduk u. im Kisilkum', fr. April 1842, *A. Lehmann* s.n., lectotype P00150916! (1992: 6) [9]. All three collections were made by Lehmann in the spring of 1842, within a ten-day interval (April 13, 22, and 23), as he and his caravan traveled along the same route. In the modern geographic reference system for

the *locus classicus* specimens, this chain of Lehmann's collection points is described as follows: Uzbekistan, Navoiy Region, Central Kyzylkum Desert, historical caravan route between Agatma depression and Bukhara oasis. The lectotype specimen clearly represents the large plants 15 – 21 cm high above cataphyll, with big ± ovoid corms 4.5 – 6.5 cm long and membranous corm tunics, 4 – 5 leaves 1.5 – 2 cm wide, remains of the perianth tubes split to the base (only claws present), elliptic whitish (when dried) perianth limb, linear basifixed stamen c. 0.6 cm long, and rostrate, somewhat swollen capsules. Thereof, in this study the authors will rely on such morphology of *C. robustum* s.str. and the concept of this species in the narrow sense. Moreover, in our opinion, typical representatives of *C. robustum* in the narrow sense were discovered by us in the southern foothills of Alborz and on Aladagh: with broad leaves, whitish/pinkish flowers with narrowly lanceolate to linear perianth lobes, and swollen capsules.

It should be noted that *Colchicum robustum* specimens were first described for Iran as *Merendera persica* Boiss., Diagn. Pl. Orient. ser. 1, 13: 37 (1854); type: Iran, Tehran: 'Prope Teheran, ad pedes montis Totschal', [1847], *Kotschy* 80, holotype G-BOISS, isotypes BM, E. We have encountered plants with such morphology in the Iranian provinces of Semnan, Mazandaran and North Khorasan. However, further northeast in the Iranian provinces of North Khorasan and Razavi Khorasan, we encountered plants with a somewhat different, distinct morphology: (1) small plants with narrow leaves, numerous pure white flowers, short anthers, and narrow cylindrical capsules, as well as we observed there (2) larger plants with wider leaves, often single dark-pink flowers, very long linear anthers, and short cylindrical capsules. In some populations, these two morphs are often syntopic, but we did not encounter their hybrids with intermediate morphologies [15].

Initially, *Colchicum breviantherum* sp. nova was collected in the lowlands of the Arvaz Valley of the Kopet Dag (former Turkmen SSR; 1000 – 1200 m, Ahal and Balkan Regions, Turkmenistan) and introduced in the 1970s by the Lithuanian gardener Eugenius Dambrauskas. Further it was distributed by Baltic gardeners in the USSR under the tentative name of *Merendera jolantae* Czerniak., in Izv. Glavn. Bot. Sada SSSR 29: 133 (1930), Repert. Spec. Nov. Regni Veg. 27: 264 (1930). However, upon examination of the *M. jolantae* holotype specimen housed in LE, it becomes clear that this herbarium specimen (Turcomania borealis, in montibus Kopet-dagh, Rasarash 9732´ [Rizarash, Kuh-e Reza], ad nives deliquescentes', 9.VI.1924, *Czerniakowska* No. 160, holotype LE00054944!) represented by plants with long linear anthers (7 – 9 mm) and 3 – 4 broad leaves, slightly pointed at the top; the plants were collected at the beginning of June from *c.* 3000 m near a snowfield [2, 3]. Thus, based on the set of the above characteristics, we attribute it here to *C. robustum*.

Accordingly, we describe below two new species from the *Colchicum robustum* complex, growing exclusively in Kopet Dag: *C. breviantherum* and *C. khorassanicum*.

Materials and methods

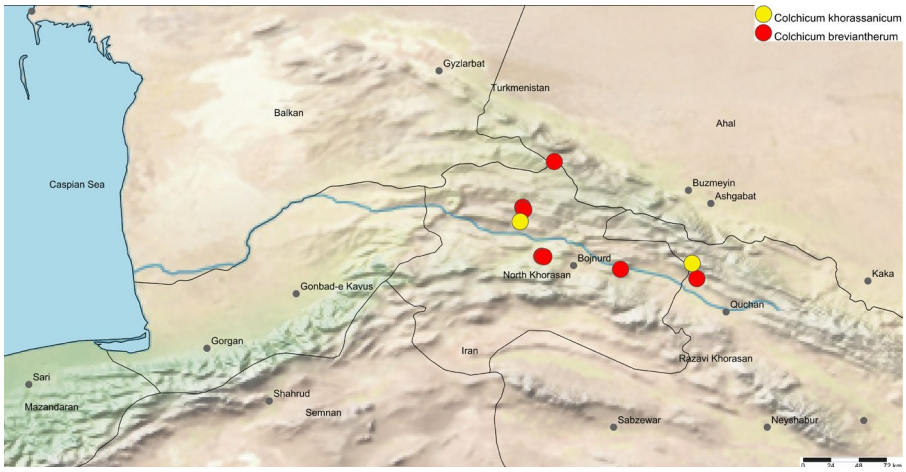
Field studies for *Colchicum breviantherum* and *C. khorassanicum* were undertaken in Iran, Kopet Dag Mountains, in Apr. – May 2008 – 2025. Herbarium specimens of other related *Colchicum* species were examined in virtual herbaria at FRU, K, LWKS, LE, MW, P, RIG II (abbreviations after Thiers [14]). Measurements, colours, and other details are based on living material and herbarium specimens, and data derived from field notes and cultivated plants. Morphological examinations were made using a zoom stereomicroscope SMZ800N (Nikon Instruments Inc., Japan). Morphological terminology follows Beentje, Jung et al., Persson [1, 5, 9]. A distribution map was plotted using recorded coordinates from the field notes, virtual herbaria data, iNaturalist community mapping, the Global Biodiversity Information Facility (GBIF), and from the literature, verified by Google Earth Pro 7.3 (©2017 Google), and produced using SimpleMappr on-line tool for creating maps [12]. A preliminary conservation status of *C. breviantherum* and *C. khorassanicum* was informally assessed following the IUCN's Red List Categories and Criteria (IUCN 2024 [4]). Extent of occurrence (EOO) and area of occupancy (AOO) were calculated using ground point data and ShinyGeoCAT for geospatial analysis for Red List assessment [7] based on the recommended grid size of 2×2 km. The same applies to the Addendum section.

Taxonomic Treatment

Colchicum breviantherum *Zubov & Rukšāns* **sp. nov.** Type: Iran, North Khorasan Province, Kopet Dag Mts, 24 km before Bojnurd, on granite outcrops; at elevation of 730 m; cult. (specimen WHIR-072 grown from wild collected seeds in J. Rukšāns' garden, Latvia), fl. 06 Mar. 2025, *Zubov & Rukšāns* s.n. (holotype RIG BOT II – 17837!).

Corm 2 – 4 × 1.5 – 2.5 cm, globose to subglobose and oblong, with directed downward hypopodium lobe (juvenile and seedling corms markedly elongated, digitiform), often heavily wrapped in numerous brown scaly layers of the corm tunic remains from foregoing years, extended into a long, tough neck up to 4 – 5 cm long; corm tunic of the current year light brown, golden-brown to dark brown and fulvous, matte, scabrous, thick, ± strongly nerved, coriaceous; *hypopodium lobe* prominent, hemispherical to cuneate, enclosed within an entire, corrugated basal collar of the common tunic up to 9 – 15 mm wide. *Cataphyll* 6 – 7 cm long, membranous, greenish-white with pronounced green veins, oblique, 1 – 3 cm above ground. *Stem* 3 – 8 cm in lengths at maturity, bright green, cylindrical in cross section, with alternate leaf arrangement. Leaves 4 – 11, 10 – 17 × 0.3 –1.5 cm at maturity, upper leaves shorter and narrower than basal ones; synanthous; equaling or somewhat exceeding flowers

at anthesis, falcate-recurved at postanthesis, matte, bright green to dark green, ± linear to lanceolate-linear, fleshy and stiff, keeled, canaliculated, with acuminate apex; leaf margins entire, slightly cartilaginous, minutely papillose. *Flowers* 4 – 6, hypogynous, up to 2 – 6 cm long from ground level, campanulate-infundibuliform, stellate (flattened out and bend sharply downward at the limb base in full sun), perianth tube split to the base (disintegrating flower). *Perianth segments* 6, not fused, in two whorls, *limb* 20 × 11 – 12 mm, exclusively pure white, narrowly linear to oblong-lanceolate, with insignificantly cuculate, subacute to retuse and obtuse-cucullate fine undulate apex, without basal auricles laterally; claw longer than limb, pure white, 55 – 65 mm long. *Androecium: stamens* 6, dithecal, subequal, in two whorls, shorter than segments, overtopping styles. *Filaments* 4 – 6 mm long, white, basally adnate to border zone of limb/claw, with a nectary at the swollen base; *nectary* at filament base prominent, c. 1 mm, adnate (pouched), tuberculate, contrast dark olive-green (nectariferous foveola closed); anthers up to 3 – 8 (– 10) mm long, extrorse, basifixed, rigid, linear, twisted at dehiscence, sagittate at base, purplish to grey blue greenish; *connective* white, prominent throughout the entire length of the anther. *Pollen* yellow; grains oblate, ovoid. *Gynoecium* (ovary and receptacle) syncarpous, tricarpellate, carpels connate; ovary 5 – 6 mm in lengths, up to 2 – 4 cm underground, sessile, superior, oblong-cylindrical, ± 3-angled, greenish; *ovules* numerous, half-anatropous, bitegmic, c. 0.6 mm, arranged in two placenta rows in axillary position per each locule; *styles* 3, free, 5.5 – 6 mm long, filiform, yellowish to greenish, equal to or slightly exceeding the stamens; *stigmas* punctiform, straight or hooked. *Fruit* 2 – 6, beaked, dehiscent, narrowly acutate-oblong to acutate-oblong, not inflated, trigonous, smooth capsule, subdivided by three septa, olive-green with a greenish short pedicel, c. 3 mm; *capsule* septicidal, 15 – 30 × 8 – 10 mm at maturity, with markedly protruding seeds over the entire capsule surface, open from the top and disconnect septicidally. *Seeds* strophiolate, 2 – 3 mm in diam., multiple in capsule, globose, equal, with rugulose, dull reddish-brown testa, small strophiole from the micropyle side c. 0.5 mm long, and a noticeable meridional pale coloured thread-like raphe extending from the micropyle to the chalaza areas.



Map 1 Distribution of *Colchicum breviantherum* (red) and *C. khorassanicum* (yellow) showing the collection localities in Kopet Dag (Turkmen-Khorasan) Mountain Range [retrieved http://www.simplemappr.net. (Accessed 09 Apr. 2026)].





Figs 1A, B. *Colchicum breviantherum* flowering, ex Kopet Dag, North Khorasan Province, Iran; cultivated in J. Rukšāns' nursery and D. Zubov's garden; March 2011, 2026 (photos – J. Rukšāns, D. Zubov).



Fig. 1C. *Colchicum breviantherum* flowering, ex Kopet Dag, Arvaz Valley, Turkmenistan; cultivated in D. Zubov's garden; Feb. 2024 (photo – D. Zubov).



Fig. 1D. *Colchicum breviantherum* flower details, cultivated in J. Rukšāns' nursery, February 2025 (photo J. Rukšāns).



Fig. 1E. *Colchicum breviantherum* fruiting (narrow leaves, falcate-recurved), ex Kopet Dag, North Khorasan Province, Iran; cultivated in D. Zubov's garden; May 2024 (photo – D. Zubov).



Fig. 1F. *Colchicum breviantherum* corms (coriaceous corm tunics), ex Kopet Dag, North Khorasan Province, Iran; cultivated in D. Zubov's garden; July 2022 (photo – D. Zubov).

RECOGNITION. Morphologically similar to *Colchicum robustum* s.str., but differs by having corms ± globose to subglobose and oblong, 2 – 4 cm long, with coriaceous grooved corm tunics through pronounced meridional veins; *flowers* exclusively pure white; *anthers* short linear, 0.3 – 0.8 (– 1) cm long, purplish to grey blue greenish; *leaves* 4 – 11, narrow, 0.3 – 1.5 cm wide, ± linear to lanceolate-linear, equaling or somewhat exceeding flowers at anthesis, falcate-recurved at postanthesis; *capsule* 2 – 6, narrowly acutate-oblong to acutate-oblong, not inflated, 1.5 – 3 × 0.8 – 1 cm at maturity; seeds 2 – 3 mm in diam., globose, equal, reddish-brown (vs corms ± ovoid, 4 – 7 cm long, with membranous to subcoriaceous corm tunics; *flowers* white adaxially and pinkish/mauve abaxially; anthers long linear, c. 1.5 cm long, orangey-brown; leaves 4 – 6, broad, 1.5 – 2 (– 3.5) cm wide, lanceolate, significantly shorter (not developed) than flowers at anthesis, erecto-patent at postanthesis; *capsule* 1 – 2, ovoid, inflated, *c.* 3 × 1.5 cm at maturity; seeds 3 – 5 mm in diam., globose, subequal, golden brown to brown, in *C. robustum* s.str.).

Morphologically similar to syntopic *C. khorassanicum*, but differs by having *corms* ± globose to subglobose and oblong, 2 – 4 cm long; *flowers* 4 – 6, exclusively pure white, campanulate-infundibuliform, stellate (flattened out and bend sharply downward at the limb base in full sun); *perianth segment's limb* narrowly linear to oblong-lanceolate, with insignificantly cuculate, subacute to retuse and obtuse-cucullate fine undulate apex; *anthers* short linear, 0.3 – 0.8 (– 1) cm long, purplish to grey blue greenish; leaves 4 – 11, narrow, equaling or somewhat exceeding flowers at anthesis, falcate-recurved at postanthesis; *capsule* 2 – 6, narrowly acutate-oblong to acutate-oblong, not inflated, 1.5 – 3 × 0.8 – 1 cm at maturity; *seeds* 2 – 3 mm in diam., globose, equal, dull reddish brown (*vs corms* subglobose to subrhomboid, oblong and ovoid-oblong, with lateral, one side knob-like protuberance, 4 – 6.5 cm long; *flowers* 1 – 2, concolorous rose purple, cup-shaped (cupulate); *perianth segment's limb* oblong-lanceolate, narrowly cymbiform, incurved, with cuculate subacute apex; *anthers* long linear, 1.8 – 2 cm long, brownish to blackish brown; *leaves* 4 – 6, narrow, significantly shorter (not developed) than flowers at anthesis, upright at postanthesis; *capsule* 1, cylindrical, not inflated, *c.* 4 × 1.5 cm at maturity; *seeds* 3 – 4 mm in diam., globose, subequal, dull straw brown, in *C. khorassanicum*).

DISTRIBUTION. West & Central Asia: Kopet Dag (Turkmen-Khorasan) Mountain Range; Iran (North Khorasan and Razavi Khorasan Provinces), Turkmenistan (Ahal and Balkan Provinces); syntopic with *C. khorassanicum* in certain localities in Iran; possibly, the Kopet Dag endemic. [See Map 1]

SPECIMENS EXAMINED. IRAN.

Colchicum breviantherum, North Khorasan Province, Kopet Dag Mts, 24 km before Bojnurd, on granite outcrops; at elevation of 730 m; cult. (specimen WHIR-072 grown from seed in J. Rukšāns' garden, Latvia), fl. 06 Mar. 2025, *Zubov & Rukšāns* s.n. (holotype RIG BOT II – 17837!); **Fig. 1G**



Fig. 1G. *Colchicum breviantherum* holotype herbarium RIG BOT II – 17837!.



Fig. 1H. *Colchicum breviantherum* paratype herbarium LWKS00033732.

Colchicum breviantherum North Khorasan Province, Kopet Dag Mts, by road to Tangeh-ye Raz, on the xeric shale hills; at elevation of 1380 m; cult. (specimen WHIR-068 grown from seed in D. Zubov's garden, Ukraine), fl. 15 Mar. 2025, *Zubov & Rukšāns* s.n. (paratype LWKS00033732!) **Fig. 1H**

HABITAT. Described from foothills and the lower mountain belt (700 – 1400 m) of the Kopet Dag Mts, zone of semi-deserts and dry mountain steppes with sparse dwarf-shrub-wormwood vegetation, on rocky substrate with clay-sand fine earth, accompanying by dominant different species of *Artemisia* L. spp. (subgen. *Seriphidium* (Besser) Rouy), *Artemisia kopetdaghensis* Krasch., Popov & Lincz. ex Poljakov, *Salsola orientalis* S. G. Gmel., thorny shrubs *Astragalus* sect. *Tragacanthae* DC. spp., *Acantholimon* Boiss. spp., *Acanthophyllum* C.A. Mey. spp., and geophytes – *Iris fosteriana* Aitch. & Baker, *I. kopetdagensis* Vved., *Allium brachyscapum* Vved., etc. Heliophyte, mesophyte, facultative halophile.



Fig. 1Y. The natural habitat of two co-occurring species of *Colchicum breviantherum* and *C. khorassanicum*, Kopet Dag zone of semi-deserts and dry mountain steppes with sparse dwarf-shrub-wormwood vegetation, 778 m, North Khorasan Province, Iran; Apr. 2016 (photo – J. Rukšāns).



Fig. 1Z. The fruiting plants of *Colchicum breviantherum* within their natural habitat, 778 m, Kopet Dag, North Khorasan Province, Iran; Apr. 2016 (photo – D. Zubov).

CONSERVATION STATUS. *Colchicum breviantherum* is endemic to the Kopet Dag (Turkmen-Khorasan) Mountain Range. Its area of occupancy (AOO) is provisionally estimated to be 28 km^2, and the new species is currently represented by seven locations (6 in Iran, and 1 in Turkmenistan). The habitat could decline rapidly due to local anthropogenic pressure, such as overgrazing; there is also the threat of small-scale collection of flowering plants and corms by illegal collectors, what could cause a slow, long-term continuing decline. Due to the limited AOO, fragmented populations and the range of threats, this species is provisionally assessed as Endangered (EN) under IUCN Red List Categories and Criteria (IUCN 2024): EN B2b(ii,iii)c(iii) (Map 1). The exact localities of *C. breviantherum* have not been documented here for fear of unlawful plant collecting.

PHENOLOGY. Flowering: Feb. – Mar.; fruiting: May.

ETYMOLOGY. The species epithet means *"short-anthered"* because the plants have the shortest anthers among the members of the entire *C. robustum* species complex.

Colchicum khorassanicum *Zubov & Rukšāns* **sp. nov.** Type: Iran, North Khorasan Province, Kopet Dag Mts, by rd. to Raz, between Agh Mazar and Raz, xeric stony slopes with sparse dwarf-shrub-wormwood vegetation, on rocky substrate with clay-sand fine earth; at elevation of 778 m; cult. (specimen 16IRS-110 grown from seed in D. Zubov garden, Ukraine), fl. 25 Mar. 2026, *Zubov & Rukšāns* s.n. (holotype LWKS00033734!) **Fig. 2.**



Fig. 2 *Colchicum khorassanicum* holotype herbarium LWKS00033734.

Corm 4 – 6.5 × 1.6 – 2.7 cm, subglobose to subrhomboid, oblong and ovoid-oblong, with directed downward hypopodium lobe and lateral, one side knob-like protuberance (juvenile and seedling corms markedly elongated, digitiform), often heavily wrapped in numerous dark-brown scaly layers of the corm tunic remains from foregoing years, extended into a long, tough neck up to 3 – 6.5 cm long; corm tunic of the current year straw brown to dark brown and fulvous, matte, scabrous, thick, subcoriaceous to membranous, ± nerved; *hypopodium lobe* prominent, hemispherical to broadly cuneate, enclosed within an entire, corrugated basal collar of the common tunic up to 0.5 – 3.2 cm wide. Cataphyll 7 – 10 cm long, membranous, white with purple, oblique, *c.* 1 cm above ground. Stem 3.5 – 5 cm in lengths at maturity, dark green with purple, cylindrical in cross section, with alternate leaf arrangement. *Leaves* 4 – 6, 12 – 16 × 0.4 –1.4 cm at maturity, upper leaves shorter and narrower than basal ones; synanthous; not exceeding flowers at anthesis, upright at postanthesis, matte, dark green, ± linear to lanceolate-linear, fleshy and stiff, keeled, canaliculated, with acuminate hooded apex; leaf margins entire, slightly cartilaginous, minutely papillose. *Flowers* 1 – 2, hypogynous, up to 2 – 3 cm long from ground level, cup-shaped (cupulate), perianth tube split to the base (disintegrating flower). *Perianth segments* 6, not fused, in two whorls, *limb* 20 – 27 mm × 7 – 8 mm, concolorous rose purple, oblong-lanceolate, narrowly cymbiform, incurved, with cuculate subacute apex, without basal auricles laterally; claw longer than limb, pure white, c. 50 mm long. *Androecium: stamens* 6, dithecal, subequal, in two whorls, shorter than segments,





Figs 2B, C. *Colchicum khorassanicum* flowering, ex Kopet Dag, North Khorasan Province, Iran; cultivated in D. Zubov's garden; March 2020, 2026 (photos – D. Zubov).

significantly overtopping styles. *Filaments c.* 3 mm long, pinkish to rose purple, basally adnate to border zone of limb/claw, with a nectary at the swollen base; *nectary* at filament base prominent, *c.* 1 mm, adnate (pouched), fusiform, contrast green (nectariferous foveola closed); *anthers* 1.8 – 2 cm long, extrorse, basifixed, rigid, linear, twisted at dehiscence, sagittate at base, brownish to brown-blackish; *connective* pinkish, prominent throughout the entire length of the anther. *Pollen* yellow; grains oblate, prolate-ellipsoidal. *Gynoecium* (ovary and receptacle) syncarpous, tricarpellate, carpels connate; *ovary c.*10 mm long, up to 2 – 4 cm underground, sessile, superior, elongated-conical, ± 3-angled, greenish-yellow; *ovules* numerous, half-anatropous, bitegmic, c. 1 mm, arranged in two placenta rows in axillary position per each locule; *styles* 3, free, c. 6 mm long, thickened-filiform, straight, greenish, yellowish to apex, distinctly shorter than stamens; *stigmas* punctiform, straight. *Fruit* 1, beaked, dehiscent, ± cylindrical, not inflated, trigonous, smooth capsule, subdivided by three septa, green with a greenish short pedicel, c. 3 mm; *capsule* septicidal, c. 4 × 1.5 cm at maturity, with markedly protruding seeds over the entire capsule surface, open from the top and disconnect septicidally. *Seeds* strophiolate, 3 – 4 mm in diam., multiple in capsule, globose, subequal, with rugulose, dull brown to golden-brown testa, small strophiole from the micropyle side c. 1 mm long, and a noticeable meridional pale coloured thread-like raphe extending from the micropyle to the chalaza areas. **Figs 2, 4 – 7**.



Fig. 2D. *Colchicum khorassanicum* fruiting (narrow leaves, upright), ex Kopet Dag, North Khorasan Province, Iran; cultivated in D. Zubov's garden; May 2024 (photo – D. Zubov).



Fig. 2D. *Colchicum khorassanicum* corms (subcoriaceous to membranous corm tunics), ex Kopet Dag, North Khorasan Province, Iran; cultivated in D. Zubov's garden; Oct. 2025 (photo – D. Zubov).

RECOGNITION. Morphologically similar to *C. robustum* s.str., but differs by having *flowers* concolorous rose purple, cup-shaped (cupulate); *perianth segment's limb* oblong-lanceolate, narrowly cymbiform, incurved; *leaves* narrow, 0.4 – 1.4 cm wide, dark green, ± linear to lanceolate-linear, upright at postanthesis; capsule cylindrical, not inflated, c. 4 × 1.5 cm at maturity (*vs flowers* white adaxially and pinkish/mauve abaxially, campanulate-infundibuliform to infundibuliform; *perianth segment's limb* narrowly linear to lanceolate-linear, not cymbiform, not incurved; *leaves* broad, 1.5 – 2 (– 3.5) cm wide, mid green, lanceolate, erecto-patent at postanthesis; *capsule* ovoid, inflated, c. 3 × 1.5 cm at maturity, in *C. robustum* s.str.).

DISTRIBUTION. West Asia: Kopet Dag (Turkmen-Khorasan) Mountain Range; Iran (North Khorasan and Razavi Khorasan Provinces), possibly, in Turkmenistan; syntopic with *C. breviantherum* in certain localities; possibly, the Kopet Dag endemic. **Map 1.**

SPECIMENS EXAMINED. IRAN.

Colchicum khorassanicum, North Khorasan Province, Kopet Dag Mts, by rd. to Raz, between Agh Mazar and Raz, xeric stony slopes with sparse dwarf-shrub-wormwood vegetation, on rocky substrate with clay-sand fine earth; at elevation of 778 m; cult. (specimen 16IRS-110 grown from seed in D. Zubov garden, Ukraine), fl. 25 Mar. 2026, *Zubov & Rukšāns* s.n. (holotype LWKS00033734!); Fig 2.

Merendera robusta, Razavi Khorasan Province, Kopet Dag Mts, 25 miles N.W. of Quchen (Gochtan), 7000´ alt., limestone mountain with eroding yellow earth and rock slabs; *Furse* 5195, fl. 06 Apr. 1964 (K002373446!).

HABITAT. Described from foothills and the lower mountain belt (700 – 1400 m) of the Kopet Dag Mts, zone of semi-deserts and dry mountain steppes with sparse dwarf-shrub-wormwood vegetation, on rocky substrate with clay-sand fine earth, accompanying by dominant different species of Artemisia L. spp. (subgen. *Seriphidium* (Besser) Rouy), *Artemisia kopetdaghensis* Krasch., Popov & Lincz. ex Poljakov, *Salsola orientalis* S.G. Gmel., thorny shrubs *Astragalus* sect. *Tragacanthae* DC. spp., *Acantholimon* Boiss. spp., *Acanthophyllum* C.A.Mey. spp., and geophytes – *Iris fosteriana* Aitch. & Baker, *I. kopetdagensis* Vved., *Allium brachyscapum* Vved., etc. Heliophyte, mesophyte, facultative halophile.





Figs 3A, B. *Colchicum robustum* flowering, ex Aladagh Mountains, North Khorasan Province, Iran; cultivated in D. Zubov's garden; March 2026, Apr. 2022 (photos – D. Zubov).

Fig. 3C. *Colchicum robustum* fruiting (broad leaves, erecto-patent), ex Aladagh, North Khorasan Province, Iran; cultivated in D. Zubov's garden; March 2026, Apr. 2022 (photos – D. Zubov).







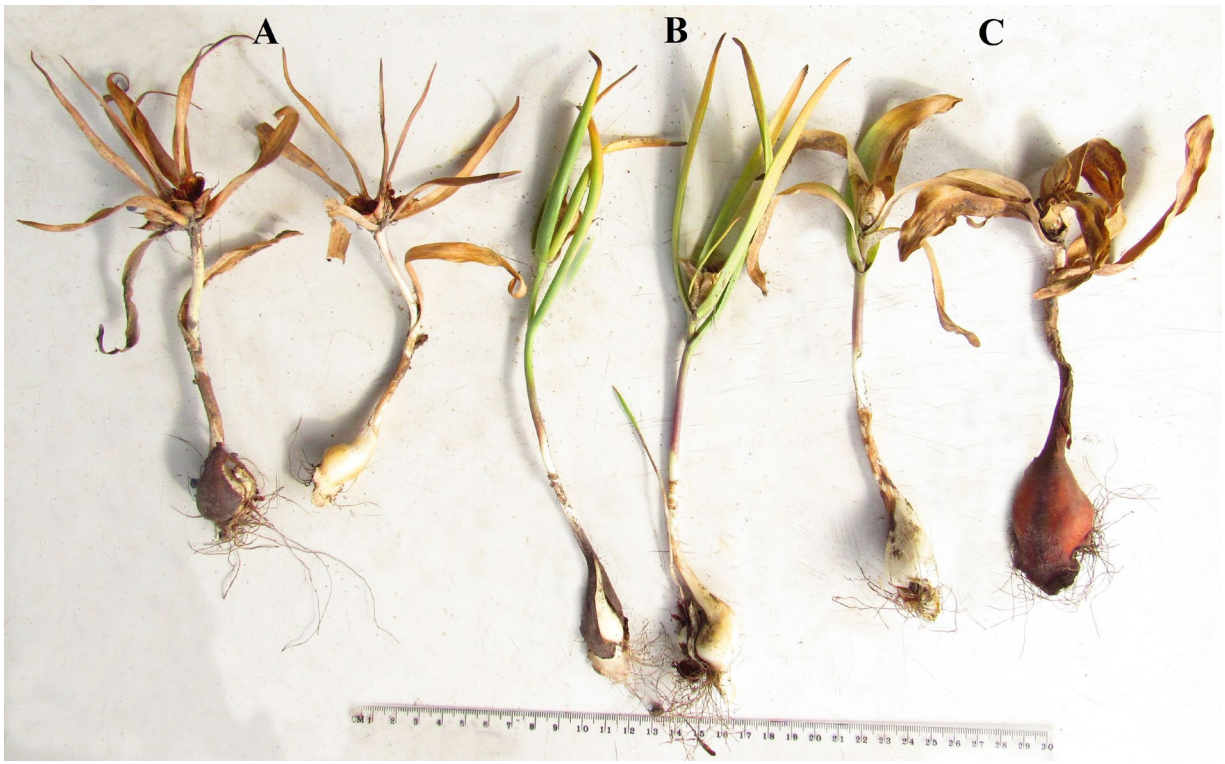
Figs 3D, E. Comparative view of the mature flowering size corms of the Aladagh's *Colchicum robustum*, corm tunics subcoriaceous to membranous (A), and *C. breviantherum*, corm tunics coriaceous (B); cultivated in D. Zubov's garden; June 2020 (photos – D. Zubov).

CONSERVATION STATUS. *Colchicum khorassanicum* is endemic to the Kopet Dag (Turkmen-Khorasan) Mountain Range. Its area of occupancy (AOO) is provisionally estimated to be 8 km^2, and the new species is currently represented by 2 locations. The habitat could decline rapidly due to local anthropogenic pressure, such as overgrazing; there is also the threat of small-scale collection of flowering plants and corms by illegal collectors, what could cause a slow, long-term continuing decline. Due to the limited AOO, fragmented populations and the range of threats, this species is provisionally assessed as Critically Endangered (CR) under IUCN Red List Categories and Criteria (IUCN 2024): CR B2b(ii,iii) c(iii) (Map 1). The exact localities of *C. khorassanicum* have not been documented here for fear of unlawful plant collecting.



Fig. 5. Comparative view of the individual perianth segments of the Aladagh's *Colchicum robustum* (A), *C. khorassanicum* (B), *C. breviantherum* (C), and *C. talassicum* (D); cultivated in D. Zubov's garden; March 2024 (photo – D. Zubov).

Fig. 6. Comparative view of the individual post-vegetative plants of *Colchicum breviantherum* (A), *C. khorassanicum* (B), and the Aladagh's *C. robustum* (C); cultivated in D. Zubov's garden; June 2024 (photo – D. Zubov).



PHENOLOGY. Flowering: Mar. – Apr.; fruiting: May – June.

ETYMOLOGY. Named after Khorasan historical region of modern-day northeastern Iran, southern Turkmenistan, and northern Afghanistan; the name Khorasan is Persian meaning "where the sun arrives from" or "the Eastern Province". The Greater Khorasan Civilization was a major cultural and intellectual center in Central Asia during the Middle and Late Bronze Age.

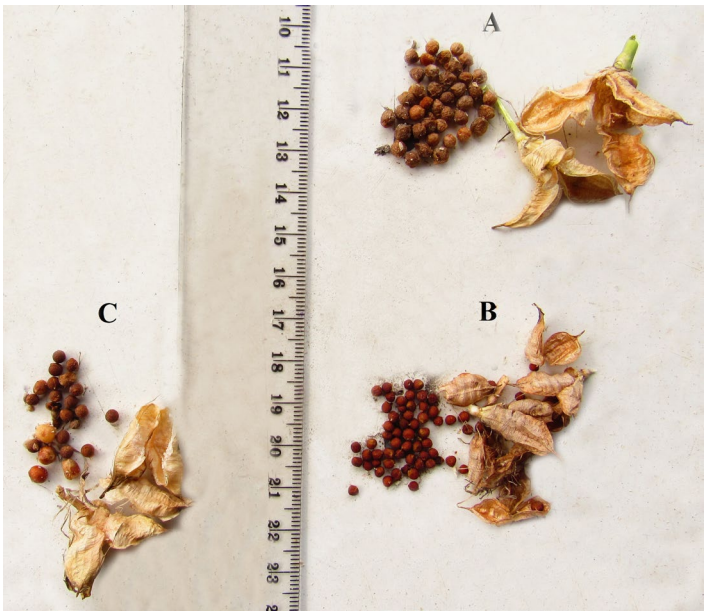


Fig. 7. Comparative view of the dehisced capsules and mature seeds of *Colchicum khorassanicum*, capsule ± cylindrical, not inflated; seeds globose, dull brown to golden brown (A), *C. breviantherum*, capsule ellipsoid-oblong, not inflated; the finest globose seeds, dull reddish brown (B), and the Aladagh's *C. robustum*, capsule ovoid, swollen; seeds globose, dull light to dark brown (C); cultivated in D. Zubov's garden; June 2024 (photo – D. Zubov).



Fig. 8. Comparative view of the mature flowering size corms of the Aladagh's *Colchicum robustum*, corm tunics subcoriaceous to membranous (A), *C. khorassanicum*, corm tunics subcoriaceous to membranous (B), *C. breviantherum*, corm tunics coriaceous (C), and *C. talassicum*, corm tunics submembranous (D); cultivated in D. Zubov's garden; July 2026 (photos – D. Zubov).

Identification key for the *Colchicum robustum* complex species with a split to the base tube of perianth (West & Central Asia: Iranian Plateau, Kopet Dag, Tian Shan)

1. Flowers single to numerous, whitish to pinkish and purplish; anthers long linear, 1 – 1.7 cm long……..……..……..…**2.**

1. Flowers numerous, exclusively pure white; anthers short linear, 0.3 – 0.8 cm long (only in Kopet Dag, foothills/lower mountain belt).……....**C. breviantherum sp. nova**

2. Corm massive, 4 – 7 cm long; corm tunics coriaceous to subcoriaceous and membranous; leaves 4 – 6; seeds globose …… **3.**

2. Corm small to medium size, 2.5 – 4 cm long; corm tunics papery to submembranous; leaves 4 – 8 (– 12); seeds ovoid (only in Talas, Kyrgyzstan) …..……..……**C. talassicum**

3. Flowers white or pink adaxially and pinkish/mauve abaxially, campanulate-infundibuliform to infundibuliform; perianth segment's limb narrowly linear to lanceolate-linear, not cymbiform, not incurved; leaves broad, 1.5 – 2 (– 3.5) cm wide, mid green, lanceolate, erecto-patent at postanthesis; capsule ovoid, inflated at maturity ..... **C. robustum s.str.**

3. Flowers concolorous rose purple, cup-shaped (cupulate); perianth segment's limb oblong-lanceolate, narrowly cymbiform, incurved; leaves narrow, 0.4 – 1.4 cm wide, dark green, ± linear to lanceolate-linear, upright at postanthesis; capsule cylindrical, not inflated at maturity (only in Kopet Dag, foothills/lower mountain belt).....**C. khorassanicum sp. nova**

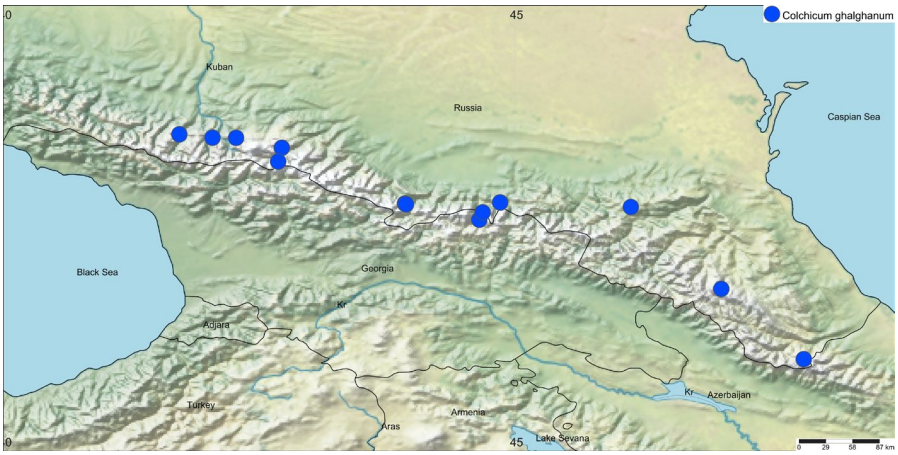
ADDENDUM

The Ingush Colchicum

Colchicum ghalghanum (*Otsch.*) *Zubov & Rukšāns*, **comb.nov**. ≡ *Merendera ghalghana* Otsch., 1963, in Zametki Sist. Geogr. Rast. 23: 65; Galushko 1978, in Fl. Sev. Kavk. 1: 149; Gabrieljan & Mordak 2006, in Takhtajan, Caucasian Flora Conspectus 2: 58; Persson 2007, in Botanische Jahrbücher für Systematik 127: 222, p.p., as *C. trigynum*; Zernov, Alekseev & Onipchenko 2015, in Guide to vasc. pl. Karachay-Cherkessia Rep.: 121, fig. ibid., p.p., as *M. trigyna*; Khizrieva 2017, in Diss… Fl. Gorny Dagestan: 32, fig. B.30. — Type: Eastern Caucasus – Russia, Ingushetia (Dzheyrakhsky District): 'Caucasus septentr. fauc. fl. Assa, in pratis regionis alpinae jugi Zey-lam [Tsey-Loam mountain range]', 11.V.1959, *Otschiauri & Kimeridze* s.n. (holotype TGM!).

Morphological description based on living introduced plants gathered from Central Caucasus: Lysaya Mt., 2300 m, Teberda, Karachay-Cherkessia, Russia:

Corm 1 – 3.5 × 1 – 2.3 cm, globose to ovoid, with directed downward short hypopodium lobe, often wrapped in numerous dark-brown layers of the corm tunic remains from foregoing years, extended into a long soft neck up to 2 – 9 cm long; corm tunic of the current year straw-brown to brown, ± lustrous, membranous, veined; *hypopodium lobe* short, hemispherical to slightly beaked, enclosed within an entire, corrugated basal collar of the common tunic up to 4 – 8 mm wide. *Cataphyll c.* 6 cm long, firmly membranous, veined, white with purple in the above-ground part, oblique, 0.5 – 1.2 cm above ground. *Stem* 2 – 4 cm in lengths at fruiting, bright green, one side-flattened-cylindrical in cross section, with alternate leaf arrangement. *Leaves* 3, 15 – 17 × 5 –10 mm at maturity; synanthous; equaling to flowers, often falcate at postanthesis, matte, reddish dark green with silvery grey sheen at anthesis, dark green, ± narrowly linear to narrowly lanceolate-linear, fleshy and stiff, keeled, significantly canaliculated, with acuminate hooded apex; leaf margins entire, hyaline up to 0.1 mm wide, minutely papillose; leaves minutely papillose on both sides. *Flowers* 1 – 3, hypogynous, up to 4 – 5 cm long from ground level, infundibuliform, stellate (flattened out and reflexed-arcuate in full sun), perianth tube split to the base (disintegrating flower). *Perianth segments* 6, not fused, in two whorls, *limb c.* 25 × 6 mm, rose purple, narrowly strap-shaped, with insignificantly cuculate, subacute apex and two short-cuneate basal auricles laterally holding free perianth segments together at the limb base; claw longer than limb, thickened, white, 40 – 60 mm long. *Androecium: stamens* 6, dithecal, subequal, in two whorls, shorter than segments and styles. *Filaments* up to 6 mm long, white, basally adnate to border zone of limb/claw, with a well-developed nectary at the swollen base; nectary at filament base 4 × 1.2 mm, bold, ± clavate, dirty dark, flanked by two longitudinal grooves at the limb base, forming a nectariferous groove (an open foveola); *anthers* 2 – 3 mm long, extrorse, dorsifixed, versatile, deltoid at dehiscence, orange; *connective* well-developed, ± inflated, white. *Pollen* yellow; grains ovoid. *Gynoecium* (ovary and receptacle) syncarpous, tricarpellate, carpels connate; *ovary* 2.5 – 3 mm long, up to 2 – 4 cm underground, sessile, superior, acutate-cylindrical, ± 3-angled, creamy; *ovules* numerous, half–anatropous, bitegmic, *c.* 0.8 mm, subglobose, arranged in two placenta rows in axillary position per each locule; *styles* 3, free, *c.* 5 mm long, filiform, contorted, white, exceeding the stamens; *stigmas* punctiform, straight or hooked. *Fruit* 1 – 2, beaked, dehiscent, acutate-ovoid, ± inflated, trigonous, smooth capsule, subdivided by three septa, olive-green; *capsule* septicidal, *c.* 20 × 15 mm at maturity, open from the top and disconnect septicidally. *Seeds* strophiolate, unequal, 2.5 – 4.4 mm long, few in capsule, globose and subglobose to ovoid, with rugulose, dull golden-brown testa, small strophiole from the micropyle side *c.* 0.2 mm long. **Figs A1 – A3, A8; Map A1.**



Map A1. Distribution of *Colchicum ghalghanum* showing the collection localities in Central & Eastern Caucasus [retrieved from http://www.simplemappr.net. (Accessed 20 Apr. 2026)].





Figs A1, A2. *Colchicum ghalghanum* flowering (flowers reflexed-arcuate), ex C Caucasus, Teberda vicinities, Karachay-Cherkessia, Russia; cultivated in D. Zubov's garden; Apr. 2025, March 2026 (photos – D. Zubov).



Fig. A3. *Colchicum ghalghanum* corms (membranous corm tunics), ex C Caucasus, Teberda vicinities, Karachay-Cherkessia, Russia; cultivated in D. Zubov's garden; July 2022 (photo – D. Zubov).

DISTRIBUTION. Central & Eastern Caucasus; **Georgia**: Mtskheta-Mtianeti Region, Kazbegi Municipality; **Russia**: Republics of Ingushetia, Chechnya, North Ossetia-Alania, Karachay-Cherkessia, Kabardino-Balkaria, and Dagestan); the C & E Caucasus endemic. Possibly, it also grows in the north of Azerbaijan. **Map A1.**

SPECIMENS EXAMINED.

GEORGIA:

M. ghalghana, Mtskheta-Mtianeti Region, Kazbegi Municipality, Kazbegi [Stepntsminda] vill., place "Cocechi", subalpine meadows, pasture, 1750 m, *Chucishvili*, fl. 11 May 1964 (TBI!);

M. ghalghana, Mtskheta-Mtianeti Region, Kazbegi Municipality, right bank of the Chdiskali [Khde] Riv., on meadows, *Chucishvili*, Ochiauri, 30 March 1964 (TBI!).

RUSSIA:

Merendera ghalghana, Ingushetia, Dzheyrakhsky District, Caucasus septentr. fauc. fl. Assa, in pratis regionis alpinae jugi Zey-lam [Tsey-Loam mountain range]', *Otschiauri, Kimeridze*, fl. 11 May 1959 (holotype TGM!);

M. ghalghana, Dagestan, Dokuzparinsky District, nr Kurush vill., alpine meadow, 2700 m, *Magomedov*, fl. 26 May 1988 (MW1017633!);

M. ghalghana, Karachay-Cherkessia, upper reaches of the Ullu-Khurzuk Riv., Sadyrla-bashi, talus, 2800 m, *Magulayev*, fr. 04 Aug.1989 (MW0654825!);

M. trigyna, Chechnya, Kezenoy-Am, grassy slope, 2400 m, *Magulayev*, fl. 25 May 1974 (MW0654855!);

M. trigyna, Kabardino-Balkaria, Adyl-Su, sod-covered slope of the right side of the valley (SW exposure), 2300 m, *Kudikov, Zernov*, fl. 24 March 2007 (MW0654853!);

M. trigyna, Kabardino-Balkaria, Baksan Gorge, Kyrtyk tract, alpine meadow, 2500 m, *Deystfeldt*, fr. 14 July 1983 (MW0654854!);

M. trigyna, Karachay-Cherkessia, Karachayevsky District, eastern slope (towards Uchkulan) of the Daut (Ybchik) Pass, on the scree, nr melting snow, 2300 m, *Zernov, Shidakov*, fl. 16 May 2007 (MW0654850!);

M. trigyna, North Ossetia-Alania, Ardon Riv. basin, North Ossetian Nature Reserve, southern slope of Tsei Ridge above Verkhny Tsei vill., subalpine meadow, nr the upper tree line, S exposition, 2130 m, *Pavlov*, *Amirkhanov, Ermolayev*, fl. 25 Apr. 1976 (MW0654856!; MW0654858!);

M. trigyna, North Ossetia-Alania, Ardon Riv. basin, North Ossetian Nature Reserve, southern slope of Tsei Ridge above Verkhny Tsei vill., subalpine meadow, S exposition, 1900 m, *Pavlov*, *Amirkhanov*, *Ermolayev*, fl. 25 Apr. 1976 (MW0654857!).

HABITAT. Subalpine and alpine zones of C & E Caucasus, at the upper forest line, in high mountain meadows, on scree slopes, near melting snowfields, on turfy slopes of valleys, at elevation of 1700–2800 m. Mesophyte.





Figs A4, A5. *Colchicum trigynum* flowering (flowers broadly open-campanulate), ex C Transcaucasia, Vanadzor vicinities, Lori Province, Armenia; cultivated in D. Zubov's garden; March 2026 (photos – D. Zubov).





Figs A6, A7. *Colchicum trigynum* flowering (flowers broadly open-campanulate), ex Armenian Highlands, Akveren Pass, Erzurum Province, Turkey; cultivated in D. Zubov's garden; March 2026 (photos – D. Zubov).



Fig. A8. Comparative view of the mature flowering size corms of *Colchicum trigynum* (leathery/coriaceous corm tunics), ex C Transcaucasia, Vanadzor vicinities, Lori Province, Armenia (A); *C. ghalghanum* (membranous corm tunics), ex C Caucasus, Teberda vicinities, Karachay-Cherkessia, Russia (B); and *C. trigynum* (leathery/coriaceous corm tunics), ex Armenian Highlands, Akveren Pass, Erzurum Province, Turkey (C); cultivated in D. Zubov's garden; July 2026 (photo – D. Zubov).

CONSERVATION STATUS. *Colchicum ghalghanum* is endemic to the Central & Eastern Caucasus. Its area of occupancy (AOO) is provisionally estimated to be 52 km^2, and the species is currently represented by 13 locations (11 in Russia, and 2 in Georgia). The habitat could decline rapidly due to local anthropogenic pressure, such as overgrazing; there is also the threat of small-scale collection of flowering plants and corms by illegal collectors, what could cause a slow, long-term continuing decline. Due to the limited AOO, fragmented populations and the range of threats, this species is provisionally assessed as Endangered (EN) under IUCN Red List Categories and Criteria (IUCN 2024): EN B2b(ii,iii) c(iii) (Map A1).

PHENOLOGY. Flowering: (April –) May; fruiting: end June – July (– August).

ETYMOLOGY. Named after the Ghalghai (translated as "people/inhabitants of towers"), the self-name (endonym) of the Ingush people, who inhabit the Assa Gorge in Ingushetia, from where this species was described in 1963 [8].

Although Karin Persson states that Merendera ghalghana [8] was considered conspecific with *Colchicum trigynum* (= *M. trigyna* (Steven ex Adams) Stapf) [10], but by a set of morphological characters they are well different, so we decided based on our field, herbaria and introduction studies, to separate *C. ghalghanum* comb.nov. with its given distribution only in Central & Eastern Caucasus (Georgia, Russia). But *C. trigynum* s.str. is distributed within Caucasus, Armenian Highlands, and Transcaucasia (Georgia, E Turkey: only Erzurum Province, Russia, Armenia, and possibly, Azerbaijan).



Fig. A9. *Colchicum raddeanum* flowering (flowers broadly open-campanulate), ex S Transcaucasia, Jermuk vicinities, Vayots Dzor Province, Armenia; cultivated in D. Zubov's garden; March 2020 (photo – D. Zubov).



Fig. A10. *Colchicum raddeanum* corms (papery corm tunics), ex S Transcaucasia, Jermuk vicinities, Vayots Dzor Province, Armenia; cultivated in D. Zubov's garden; July 2022 (photo – D. Zubov).

Identification key for the Caucasian pink-flowered *Colchicum* species with a split to the base tube of perianth

1. Leaves 3, corm tunics coriaceous or membranous……..…… **2**

1. Leaves 2, corm tunics papery to submembranous……**C. raddeanum**

2. Corm tunics leathery/coriaceous produced into a rigid neck often splitting longitudinally, flowers broadly open-campanulate in full sun……..……..**C. trigynum s.str.**

2. Corm tunics membranous produced into a soft neck, flowers reflexed-arcuate in full sun……..……..**C. ghalghanum**

References

1. Beentje, H. (2010). *The Kew Plant Glossary*. *An illustrated dictionary of plants terms*. Kew Publishing, Richmond.
2. Chernyakovskaya, E. G. (1930). New data on the flora of Turkmenistan and northern Persia. *Izv. Glavn. Bot. Sada SSSR* 29(1–2): 130 – 162. [in Russian].
3. Czerniakowska-Reinecke, E. (1930). Letzte Neuheiten über die Flora Turkmenistans und Nordpersiens. *Repert. Spec. Nov. Regni Veg.* 27: 262 – 287. [in German].
4. IUCN (2024). *Standards and Petitions Committee. Guidelines for Using the IUCN Red List Categories and Criteria.* Version 16. Prepared by the Standards and Petitions Committee. https://www.iucnredlist.org/documents/RedListGuidelines.pdf.
5. Jung, L. S., Winter, S., Eckstein, R. L., Kriechbaum, M., Karrer, G., Welk, E., Elsässer, M., Donath, T. W. & Otte, A. (2011). *Colchicum autumnale* L. *Perspectives in Plant Ecology, Evolution and Systematics* 13(3): 227 – 244.
6. Lazkov, G. & Zubov, D. (2025). *Colchicum talassicum*: a new species of the *C. robustum* complex (Colchicaceae) from the Talas Region of Kyrgyzstan. *Kew Bulletin* 80(4): 923 – 930.
7. Moat, J., Bachman, S. & Walker, B. (2023). ShinyGeoCAT – Geospatial Conservation Assessment Tools (BETA) [Software]. Available from: https://spbachman.shinyapps.io/geocat_staging/. [Accessed 09 April 2026].
8. Otschiauri, D. A. (1963). Species nova generis Merenderae Caucaso. *Zametki Sist. Geogr. Rast.* 23: 64 – 65. [in Russian].
9. Persson, K. (1992). *Liliaceae III, Wurmbaeoideae, Colchicum*. In: K. H. Rechinger (ed.), *Flora Iranica* 170, pp. 1 – 40, tt. 1 – 14. Akademische Druck – u. Verlagsanstalt, Graz.
10. Persson, K. (2007). Nomenclatural synopsis of the genus *Colchicum* (Colchicaceae), with some new species and combinations. *Botanische Jahrbücher für Systematik* 127: 165 – 242.
11. Persson, K., Petersen, G., del Hoyo, A., Seberg, O. & Jørgensen, T. (2011). A phylogenetic analysis of the genus *Colchicum* L. (Colchicaceae) based on sequences from six plastid regions. *Taxon* 60(5): 1349 – 1365.
12. Shorthouse, D. P. (2010). SimpleMappr, an online tool to produce publication-quality point maps. Retrieved from http://www.simplemappr.net. [Accessed 09 – 20 April 2026].
13. Stefanov, B. (1926). Monografiya na roda *Colchicum* L. *Sborn*. Bălg. *Akad*. *Nauk*., *Klon Prir.-Mat*. 22: 1 – 100. [in Bulgarian].
14. Thiers, B. (2026). Index Herbariorum: A global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. Retrieved from https://sweetgum.nybg.org/science/ih/ [Accessed 23 June 2026].
15. Zubov, D. (2021). Cultivated *Colchicum* species (Colchicaceae) introduced in Central Ukraine. *Int. Rock Gard.* 136: 3 – 84.