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Another exciting issue of IRG, which introduces new species to teach us more about the tremendous diversity of plants. This month we learn about a new species, *Leopoldia parvipoldia* from Cappadocia, from the Latvian bulb maven, Dr Jānis Rukšāns and his Swedish collaborator, the famous plantsman, Henrik Zetterlund. Many of us are still coming to terms with the “changes” from *Muscari* to *Leopoldia* – perhaps this article will help us

understand! New names are also proposed for seven *Muscari* as *Leopoldia*.

For the second article this month Jānis works with his Ukrainian colleague, Dimitri Zubov, to bring us a new *Colchicum* species. This is *Colchicum kackareense*, a new autumn-blooming species from the Kaçkar Mountains in north-eastern Turkey. Dr Zubov, as well as his work at the State Institute of Genetic and Regenerative Medicine of the National Academy of Medical Sciences of Ukraine, is a passionate and knowledgeable plantsman, especially famous for his work with bulbous plants. So, a typically international issue of IRG – with cooperation around the world to bring this to our readers. We hope you enjoy it!

Cover image; Hummocks of sandy tufa in Cappadocia, Turkey, where *Leopoldia parvipoldia* grows: photo by Jānis Rukšāns.



Leopoldia parvipoldia RUDA-059



Colchicum kackareense LST-292

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--- Species Description ---

Leopoldia parvipoldia sp. nova (Asparagaceae): a new species of gen. Leopoldia Parl. from Cappadocia, Turkey and some new combinations

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Abstract

Leopoldia parvipoldia is described as a new species from Cappadocia, Central Anatolia, Turkey. A description and photographs of the new species (in cultivation) are given and the morphological characters of the new species are presented. Recent approach in taxonomy of genus *Muscari* sensu lato, regards several species earlier included in this genus [as subgenus *Leopoldia* (Parl.) Rouy] as belonging to own genus *Leopoldia* Parl. For this reason, some new combinations are proposed.

Key words: *Muscari*, *Leopoldia*, Cappadocia, taxonomy, Turkey

Introduction:

The three genera of the Asparagaceae: *Leopoldia*, *Muscari* and *Pseudomuscari*, alternatively recognized as subgenera within *Muscari* (e.g. Speta 1998), mostly occur over the entire Mediterranean basin as far as the Caucasus, temperate Europe, the north of Africa and the south west of Asia. Based on their karyological and morphological characteristics, Garbari & Greuter (1970) split the genus *Muscari* into four different genera: *Muscari*, *Pseudomuscari* Garbari & Greuter (1970: 334), *Leopoldia* Parlatores (1845: 435) *nom. cons.* and *Muscarimia* Kostel. ex Lozina-Lozinskaya (1935: 411). Such splitting really is supported by phylogenetic researches done by Dizkirci & al. (2018). Although the authors do not agree with such splitting, it is clearly visible on the phylogenetic tree published by them and reproduced here as fig A.

The genus *Leopoldia* Parl. (1845) may be distinguished by using several morphological characters. Fertile flowers are oblong-urceolate or tubular and strongly constricted at tip. They are usually brownish, dirty yellowish or greenish and lacking a corona, the prominent bluish to violet sterile flowers as well as the more or less zygomorphic fertile flowers with apophyses on the shoulders were used to separate genus *Leopoldia*.

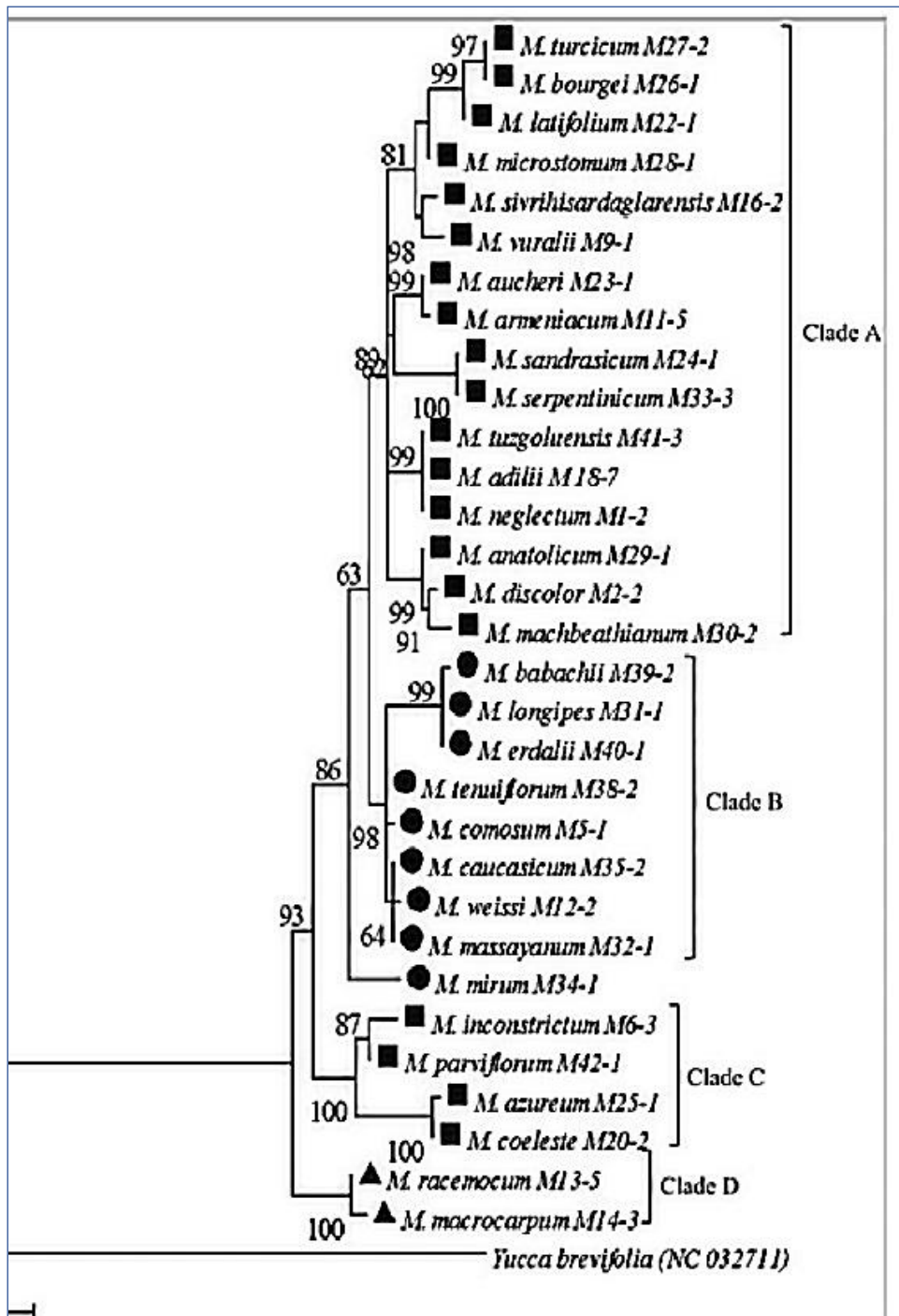


fig. A:
 Phylogenetic tree of
 the genus *Muscari*
 sensu lato
 (reproduced from
 Dizkirci & al.,2018)

According to the last nomenclature approach (not yet updated) genus *Leopoldia* includes 18 taxa (16 species and 2 taxa on subspecies level - WCSP, 2021). However, in "The Flora of Turkey and the East Aegean Islands" (1984, 2000) it is included into genus *Muscari* Mill. with three subgenera: subgen. *Muscari*, subgen. *Leopoldia* (Parl.) Rouy and subgen. *Botryanthus* (Kunth.) Rouy. Status of former subgen. *Pseudomuscari* Stuart. (in Flora of Turkey incorporated into subgen. *Botryanthus*) is now regarded as separate genus *Pseudomuscari* Garbari & Greuter (WCSP, 2021). Most of them are endemic to Turkey which is one of the

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most important centres of differentiation of the genus *Muscari* s.l., and despite the frequent studies performed in this region, new species and new records are still being reported. Although morphologically the differences between *Leopoldia* and *Muscari* are very well expressed (seeing plants during our expeditions we never had any doubt about their registration on files as *Leopoldia* or as *Muscari*), not all botanists regard splitting of genus *Muscari* as sufficiently supported, and several new species which really belong to genus *Leopoldia* were published as *Muscari*, so new taxonomical combinations are required and are proposed here.



fig.01: Cappadocia - locus classicus of *Leopoldia parvipoldia*

Results:

During one of our first research trips to Turkey (RUDA, 2003) on road-side along road from Avanos to Urgup, soon after turn to Zelve, on right side of road just near pedestrian pass sign, at altitude around 1000 m we stopped at steep slopes of almost nude hummocks formed by coarse sandy tufa and sparsely covered by dwarf shrubs. There we found growing

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Iris galatica (RUDA-059) and sparsely between them some *Muscari* sensu lato species resembling very dwarf *Leopoldia*, and so it was registered in our files. All plants of irises were invaded by some pest and when we revisited the locality a year later during BATMAN expedition organized by Gothenburg Botanical Garden, we didn't find any iris more – all plants were destroyed by the worms of this pest. But leopoldias still were growing there. In both cases we were there too late to observe them in flowers, so some bulbs were collected (samples RUDA-059 [fig.03] , BATMAN-437 [figs. 04, 05]) and grown up in our collections.

At that time it was the smallest species of *Leopoldia* grown in our collections and it kept the same habitat cultivated in much richer and moist soil conditions than in the wild. So this allowed us to regard it as a new, still unpublished species. By size it something resembles species published as *Muscari savranii* Uysal & Doğu but is easy distinguishable by non-pending pedicels of fertile flowers, leaves which are shorter than scape at blooming time and remain such in fruit and other less prominent differences (compared using description and photos of original publication of *M. savranii*).



fig.02: Hummocks of sandy tufa in Cappadocia where *Leopoldia parvipoldia* grows.

Leopoldia parvipoldia Rukšāns & Zetterlund species nova

Type: Turkey, Cappadocia, 3 km from Avanos along Avanos - Urgup road, steep slopes on chalky volcanic tufa, 38.41 N; 34.52 E, alt. 1050m, BATMAN-437.

Holo: GB – leg. J. Rukšāns, 22-05-2021, ex culturae in horto Jānis Rukšāns.

Habitat and distribution: known only from type locality in Central Anatolia where it is growing on almost nude hummocks of sandy tufa with very sparse vegetation together with *Iris galatica* and unidentified species of *Allium* sect. *Codonoprasum*. Observed at altitudes from 1000-1100 m.

Bulbs - up to 15-17(25) mm in diameter, mature +/- round to elongated, without bulblets; inner tunics white, outer light brownish.

Leaves - 2-3, smooth, greyish green, at very base purplish shaded over green, deeply canaliculated with parallel edges, shorter than scape, 12-18 cm long and (2-)4-6 mm wide, at very top shortly narrowed to pointed dull reddish tip.

Scape - up to 17-20 cm long, stout, light green, at base purplish dotted, at top where starts sterile flowers turns light blue to slightly violet shaded blue, slightly but distinctly longer than leaves.

Raceme - straight, with sparsely spaced 7-18 fertile flowers.

Pedicels of the fertile flowers - 6-9 mm long, light green, horizontal or slightly down turned; of the sterile flowers – up to 16 mm long, light blue.

Fertile flowers – 5-7 mm long, conical shaped, at base 2 mm wide, at shoulders 4(-5) mm wide; in bud dirty lilac with light green upper part, at mouth with blackish brown distinctly outward turned edges of lobes, during blooming lilac part of flower pales and fertilized flowers gradually became light green with dark lobes.

Sterile flowers – light blue to slightly lilac shaded blue, up to 4 mm long and 2 mm wide.

Ovary – indistinctly conical, 1.5(-2) mm long, light green with minutely papillose surface.

Style – short, conical, whitish and minutely papillose.

Filaments – conical, slightly less than 1 mm long, arranged into 2 rows (biseriate), lower row attached at middle of flower's tube, second row – slightly higher.

Anthers – up to 1.5 mm long and 1 mm wide, blackish brown, pollens yellow.

Stigma – white, positioned at base of upper anthers (at middle of lower anthers).

Capsule – almost round, around 8 mm in diameter, slightly longer than wide.

Seeds – round to something pyriform, up to 2 mm in diameter, with small caruncle and less prominent raphe.

Etymology: Name derived from its minor size: parvi- (from *parvus*) and -poldia (from *Leopoldia*).



fig.03: *Leopoldia parvipoldia* RUDA-059



fig.04: *Leopoldia parvipoldia* BATM-437



fig.05: *Leopoldia parvipoldia* BATM-437



fig.06: Flower details of *Leopoldia parvipoldia*



fig.07: *Leopoldia parvipoldia* seed capsules

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fig.08: *Leopoldia parvipoldia* in seed



fig.09: *Leopoldia parvipoldia* bulbs



**Holotype
specimen**

Leopoldia parvipoldia
Rukšāns & Zetterlund, species nova
BATM-437, Turkey, Avanos-Urgup Rd.
38.41 N; 34.52 E.; alt. 1050 m
ex culturae in horto Jānis Rukšāns
leg.&det. J. Rukšāns, 19-05-2021

fig.12: Holotype herbarium of *Leopoldia parvipoldia*

Required new combinations:

***Leopoldia elmasii* (Yildirim) Rukšāns & Zetterlund**

Basionim: *Muscari elmasii* Yildirim (Turkish J. Bot. 40: 380, 2016)

Type: Turkey. C2 Muğla: Fethiye, Ėaldađı, aėik Serpantin yamaėlar, 1275 m, 19.05.2014, H.Yildirim 2825 (holotype: EGE, isotypes: EGE, ANK, herbarium NGBB).

***Leopoldia erdalii* (Őzhatay & Demirci) Rukšāns & Zetterlund**

Basionim: *Muscari erdalii* Őzhatay & Demirci (Phytotaxa 154: 40, 2013)

Type: Turkey. C4 Mersin: Mut-Kirobası, 18 km of Mut, open lime soil, 1280 m, 15 June 1990, N. & E.Őzhatay, Iter Anatolicum 61829 (holotype ISTE).

***Leopoldia haradjianii* (Briq. ex Rech.f.) Rukšāns & Zetterlund**

Basionim: *Muscari haradjianii* Briq. ex Rech.f. (Ark. Bot. a.s., 5: 88, 1960)

Type: Turkey. C6 Gaziantep: Aintab (Gaziantep), Jun 1907, *Haradjian 1304* (holotype G [digital image])

***Leopoldia massayana* (C. Grunert) Rukšāns & Zetterlund**

Basionim: *Muscari massayanum* C. Grunert (Gartenwelt 35: 205, 1931)

Type: the photograph in Gartenwelt 35: 205, 1931 without indication of provenance.

***Leopoldia mirum* (Speta) Rukšāns & Zetterlund**

Basionim: *Muscari mirum* Speta [Phyton (Horn) 29: 107, 1989]

Type: : Turkey. C2 Denizli c. 20 km NE ameli, 1450-1650 m, 4.VI 1986, F. Speta s.n. (holo: Herb. Speta).

***Leopoldia muglaensis* (Eker, H.Duman & Yıldırım) Rukšāns & Zetterlund**

Basionim: *Muscari muglaensis* Eker, H.Duman & Yıldırım (Phytotaxa 475: 268, 2020)

Type: Turkey. C2 Muğla: Kőyceđiz, Sandras Mountain, Lake Kartal surroundings, on ophiolite rock cracks and serpentine soils, 1952 m, 08 June 2020, *İ. Eker 13030* (holotype AIBU; isotypes AIBU, EGE, GAZI).

***Leopoldia savranii* (Uysal & Dođu) Rukšāns & Zetterlund**

Basionim: *Muscari savranii* Uysal & Dođu (Phytotaxa 402: 158, 2019)

Type: Turkey. B5 Kayseri: Kocasinan, Oymaađa Kőyő üstleri, Jipsli yamalar, elev. 1150–1200 m, 26 April 2018, *S. Dođu 3051* (Holo KNYA).

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Acknowledgments

I want to express my greatest thanks to my long-time travel partners, who were with me in several Turkish trips - Henrik Zetterlund (Gothenburg Botanical Garden, Sweden), Arnis Seisums (National Botanical Garden, Latvia) and Eugenius Dambrauskas (Lithuania). Of course, my thanks go to my regular language consultant Mārtiņš Erminass. And I am especially thankful to my family and my wife Guna in particular, for the hard work at the nursery during my absence while in the mountains.

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--- Species Description ---

Colchicum kackarensense (Colchicaceae): a new autumn-blooming species from the Kaçkar Mountains in north-eastern Turkey

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Summary. A new hysteroanthous colchicum species similar to *Colchicum speciosum* and *C. woronowii* is described from Northern Anatolian conifer and deciduous forests of the Kaçkar Mountains in NE Turkey. Morphological and ecological differences between the new species and other related species are discussed. Photographs (habitat and morphology) and a distribution map are provided.

Key Words. Colchicum, hysteroanthous leaves, Northern Anatolian conifer and deciduous forests, the Kaçkar Mountains, Lazistan, flora of Turkey, flora of Caucasus, Flora Iranica.

Introduction

In the Synopsis of *Colchicaceae* published by John Baker in 1879 there were included 29 species of the genus *Colchicum* L. [1]. The *Merendera* Ramond and *Bulbocodium* L. were regarded by him as different genera. Next and up to last the only modern monograph of the genus *Colchicum* was one published in 1926 by Bulgarian botanist Boris Stefanov who united the genera of *Merendera* and *Bulbocodium* with *Colchicum* sensu stricto [22]. After that only studies on smaller or larger parts of distribution area and for several local floras were published. In 2007 Karin Persson from Gothenburg Botanical Garden (Sweden) published the Synopsis of the genus *Colchicum* in which were included 99 species and, following a modern approach, incorporated into genus *Colchicum* (segments connate in lower part into a tube) both genera - *Merendera* and *Bulbocodium* (both with free perianth segments) following their monophyletic microevolution pattern [19, 21]. She was opposed by Armenian researcher Gohar Oganezova, who again tried to prove that *Merendera* and *Bulbocodium* must be regarded as different genera [17]. Unfortunately, Persson didn't finish a monograph of the genus, but this gap was fulfilled in 2020 by Christopher Grey-Wilson et al., who published their "RHS Horticultural Monograph: Colchicum. The complete guide" [9].

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At species level the authors gave characteristics for 103 species (taxa of subspecies and varietal level as well as hybrid species and cultivars are characterised, too). In the new Millennium around 11 new *Colchicum* taxa at species level were published and some authors incorporated under the *Colchicum* “hat” the genus *Androcymbium* Willd. as well [15]. As a result, 61 new nomenclatural combinations were published. This approach was not supported by a phylogenetic paper of K. Persson et al. [21] and by C. Grey-Wilson et al. [9], who prepared a table showing the morphological differences between *Androcymbium* and *Colchicum*.

Colchicum speciosum Steven is one of the most popular and widely grown autumn-blooming colchicum species with large goblet-like flowers. It was described by Russian botanist and entomologist of Swiss descent – Christian von Steven, he was a founder and first director of Nikita Botanical Garden in Crimea. *Colchicum speciosum* was published by him in 1829 in the “New Memoirs of the Imperial Society of Naturalists of Moscow”, and well-illustrated by a demonstrative line drawing of a whole plant in Tab. XV (Fig. 1) [23]. He described it by plants cultivated in Crimean Nikita Botanical Garden and initially collected somewhere in Georgia by D. Wilhelms.

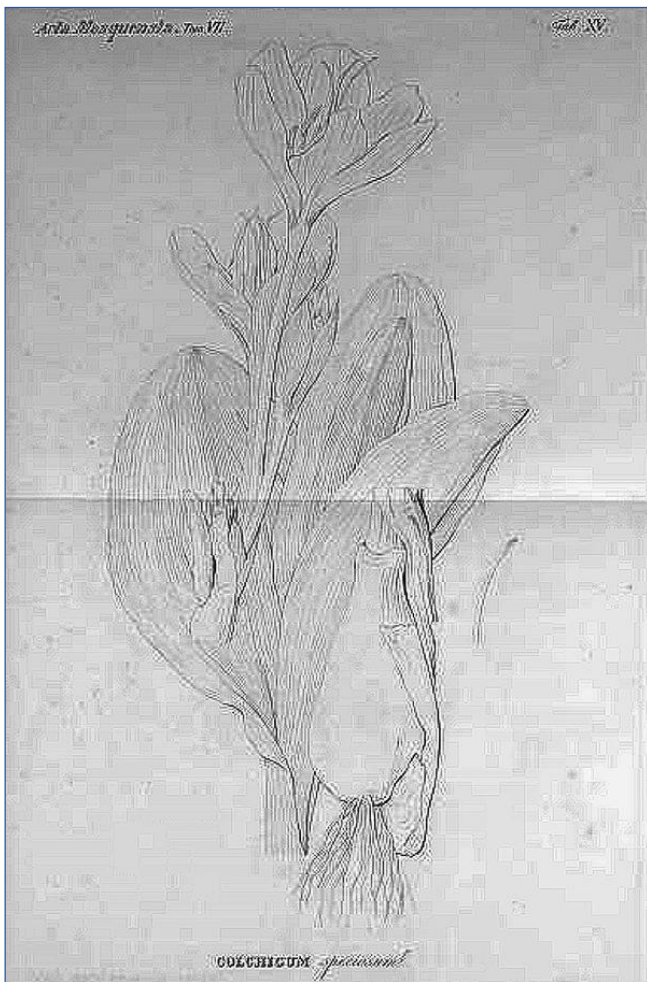


Fig.1: A historical line drawing of *Colchicum speciosum* made by the taxon author Christian von Steven in the “New Memoirs of the Imperial Society of Naturalists of Moscow”, 1829, Tab. XV [scanned from [23].

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The *Colchicum speciosum* distribution area is considered quite wide: throughout Caucasus Mountains (Russia, Georgia) and entering NE Turkey, W Armenia, S Azerbaijan and N Iran. There were several taxa published later, which were regarded as synonyms of *C. speciosum* by other authors. Russian botanist Pavel Mischenko in 1912 published a taxon of *C. speciosum* Steven var. *lenkoranicum* Misch. [16] collected near Zuvant and Lenkoran (Azerbaijan: Talysh), which was raised in the first edition of Caucasian flora in 1928 to species status as *C. lenkoranicum* (Misch.) Grossh. by Alexander Grossheim, a Russian botanist of German descent and a brilliant connoisseur of the Caucasian flora [10]. But in the second edition it was regarded by him as a synonym of *C. speciosum* [11]. The main features separating the latter from *C. speciosum* were significantly larger flowers with perianth segments up to 7 cm long, as well as larger corms. Later a Russian botanist Jurij Woronow [24] mentioned a special race without description for Talysh and northern Persia (N Iran) – *C. hyrcanicum* Woronow *nom. nud.*, which he equates to *C. speciosum* var. *lenkoranicum* Misch. Also Woronow gives *C. speciosum* distribution for subalpine zone of the forest provinces of Ciscaucasia and Transcaucasia, as well as for Turkish Lazistan.

Similar colchicum plants from Abkhazia (W Transcaucasia: Georgia) were collected and published by Woronow in 1929 as *C. liparochiadys* Woronow ex Czerniak. [earlier watercolour of this plant in LE herbarium of the Komarov Botanical Institute of the Russian Academy of Sciences (St. Petersburg, Russia) was labelled as *C. liparochlamis* Woronow *in icon. ined.*] in Flora of USSR [6], but it was described without Latin diagnosis under *C. speciosum* and so often it was included between synonyms of *C. speciosum*. Both names (*C. liparochlamis* & *C. liparochiadys*, that means “with fatty-shiny tunics”) are not included in IPNI and WCSP, not as species, nor in synonyms [8, 13]. Its characteristic features were given as obcordate, up to 5 cm long and 3.5-4 cm wide corms with cinnamon-brown lustrous as if ‘lacquered’ tunics and narrow, relatively small (only 3-5 cm long), slender narrow perianth segments. In the latter aspect it resembles the newly described *C. kackarensis*. According to the Flora of USSR, its corm tunics are prolonged into 3-3.5 cm long tube and anthers are 6 mm long. Grossheim characterizes it as having a stigma of the same length as anthers. It was validly published only in 1990 by M. Bokeria as *C. woronowii* Bokeria [4].

Colchicum bornmuelleri Freyn was published in 1889 by material collected on Mt. Ak-Dagh and Mt. Sana-Dagh, at 1600-1900 m elevation, in Amasya Province, N Turkey [7].

Internationally renowned gardener and botanist Christopher Brickell [5] characterizes it as having purple to purple brown anthers, distinctly swollen style apex with short (0.5-1.5 mm) stigmatic surface, contrary to the yellow anthers and 2-4 mm long stigmatic surface in *C. speciosum*. Karin Persson [19] regards it conspecific with *C. speciosum* and *C. Grey-Wilson*

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et al. [9] prefer to treat it as a cultivar group. *Colchicum giganteum* hort. Leichtlin ex S. Arnott is another taxon described by cultivated plants and regarded as synonym of *C. speciosum* by K. Persson or as a cultivar group by C. Grey-Wilson et al. [9, 19].

All this confirms that under the name of *C. speciosum* sensu lato very different plants regarded by various authors as different taxa are hidden. It is quite a common situation in botany that when considering some feature under one name several taxa were joined. A good example is genus *Crocus* L. where, using for distinction only corm tunics, several subspecies of plants growing in quite a wide area from Italy up to Iran were added, under the name of *Crocus biflorus* Mill. As *C. biflorus* subsp. *nubigena* (Herb.) B. Mathew was regarded for all populations with black anthers growing along western coast of Turkey and on E Aegean Islands, this really represented many different, sometimes even not genetically related taxa which were later published under proper names by e.g. Kerndorff & Pasche, Osman Erol and Rukšāns. Both authors are sure that the same situation applies with *C. speciosum* auct. non Stev. In favour of the fact that several more species are hidden under the name of *C. speciosum*, the different chromosome numbers also speak, according to K. Persson data in [20]: *Colchicum speciosum* Steven, $2n=38$ Russian Fed., Cuba 89-116; $2n=40$ Iran, W&A 27766, W&A 29670A; $2n=40$, 42, 44 Iran, JJA 2486A, 1975, *W s.n.* Interesting to note, that *C. woronowii* has shown an aneuploidy with chromosome numbers $2n=42$, 48, and for *C. speciosum* from Georgia (3 specimens) $2n=38$, according to M. Bokeria data [3].

Therefore, considering the morphological and ecological characters of more or less well-known species – *C. speciosum* and *C. woronowii*, we believe that we found in June 2005 within Lazistan area (NE Turkey) a new narrow endemic colchicum species, similar to the two above taxa, but it deserves a taxonomical description based on its distinct features.

Materials and methods

Field studies for *C. kackarensis* were undertaken in NE Turkey on June 10-11, 2005, and seed grown in cultivation was examined by us between 2006 and 2021. Herbarium specimens of other related *Colchicum* species were examined at LE, GB and K herbaria (abbreviations after [12]). Measurements, colours, and other details are based on living material, spirit and herbarium specimens and data derived from field notes (at least 12 cultivated flowered plants were measured). Morphological and anatomical examinations were made using a stereo microscope Stemi 2000-C and inverted microscope AxioObserver A1 equipped with digital camera AxioCamERc 5s and ZEN 2012 software (Carl Zeiss, Germany). Morphological terminology follows [2]. The distribution Map 1 was plotted and

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produced using specimens and recorded coordinates, verified using Google Earth Pro (©2017 Google). The preliminary conservation status of *C. kackareense* was not evaluated against the Red List Criteria [14] due to the insufficient data of the new species full-range distribution.



Fig.2: *Colchicum kackareense* LST-313 cultivated in the garden of J. Rukšāns; origin – 1300 m elevation, The Kaçkar Mountains, Artvin Province, Turkey (photo – J. Rukšāns).

Colchicum kackarens Rukšāns & Zubov **sp. nov.**

Type: Turkey, Black Sea Region, The Kaçkar Mountains, Artvin Province (A9), Yusufeli district, near vill. Barhal, under trees of coniferous forest, c. 1300 m elevation; cult. (LST-313 specimen grown in J. Rukšāns garden, Latvia), fl. 23 Aug. 2021, *Rukšāns* s.n. (holotype: GB!).

Corm ovoid-widely ovoid to oblong-ovoid, 5-6.5 cm × 2.5-3.5 cm, often with 1-1.5 cm long widely obovate ‘foot’, outer tunic dark brown, dull, membranous, inner tunic light buff, thin, extended upwards into the neck up to 1.5 cm. **Cataphylls** greenish to buff, reaching soil surface. **Leaves** 3-4, hysteranthous, suberect, glossy, bright green, lanceolate to elliptic, 16-20 cm × 3-4 cm. **Flowers** 1(-2), up to 12 cm long from ground level, bright rose-violet to purple, faintly tessellated, with large white throat reaching at least half but more often 2/3 of the perianth segment length, flower tube light greenish to slightly brownish shaded. **Perianth segments** 6, in two whorls, narrow-oblongate, 50-58 mm × 8-15 mm, length/width ratio: 3.6 to 6.4 (avg. 4.6). **Stamens** 6, in two whorls. **Filaments** 20-22 mm long, light greenish to light yellow, parallel edged, gradually narrowing at the top, filament channels finely pubescent along the ridges. **Anthers** invariably yellow, mostly 5-6 mm long. **Styles** three, free, white, rarely slightly pinkish shaded at the very top, lobes not exceeding stamens, but often even distinctly shorter, lobes distinctly more or less hooked. **Ovary, capsule and seeds** not characterized. **Figs. 2-6**



Fig.3: *Colchicum kackarens* corms cultivated in the garden of J. Rukšāns (photo – J. Rukšāns).

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Fig.4: *Colchicum kackarensense* LST-292 cultivated in the garden of J. Rukšāns; origin – 2200 m elevation, the Kaçkar Mountains, Artvin Province, Turkey (photo – J. Rukšāns).



Fig.5: Holotype sheet of *Colchicum kackarensense* deposited at GB (photo – J. Rukšāns).



Fig.6: Gynoecium & androecium details of *Colchicum kackarensis* LST-313 cultivated in the garden of J. Rukšāns; origin – 1300 m elevation, The Kaçkar Mountains, Artvin Province, Turkey (photo – J. Rukšāns).



Fig.7: Gynoecium & androecium details of *Colchicum speciosum* BARAKA-062 cultivated in the garden of J. Rukšāns; origin – Racha-Lechkhumi & Kvemo Svaneti region, Georgia (photo – J. Rukšāns).



Fig.8: Gynoecium & androecium details of *Colchicum speciosum* cultivated in the garden of J. Rukšāns; origin – Ordu Province, Turkey (photo – J. Rukšāns).

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RECOGNITION. Morphologically similar to *C. speciosum*, but differs by having perianth segments distinctly narrow-oblongate, 50-58 mm × 8-15 mm (length/width ratio 3.6-6.4); flower throat broad, white up to 2/3 of segments length; styles mostly shorter or not exceeding stamens; and woodland habitat (vs perianth segments more or less broad, elliptic-oblong to obovate, 43-80 mm × 11-30 mm (length/width ratio 2.4-3.1); flower throat white usually up to 1/3-1/2 of segments length; styles somewhat or much exceeding stamens; and mainly open alpine meadows and valleys habitats for *C. speciosum*).

Morphologically similar to *C. woronowii*, but differs by having brown to varying degrees, dull corm tunics (vs corm tunics dark brown to reddish brown, glossy, 'lacquered' in *C. woronowii*).

Distribution. Asia Minor: north-eastern Turkey, Black Sea Region, Artvin Province (south-eastern slopes of the Kaçkar Mountains); possibly, a local endemic of Lazistan.



Map 1: Map 1: Distribution of *Colchicum kackarense* (red marks), *Colchicum woronowii* (green marks) and *Colchicum speciosum* (yellow marks) based on collection localities.

Specimens examined. TURKEY. Black Sea Region, The Kaçkar Mountains, Artvin Province (A9), Yusufeli district, near vill. Barhal, under trees of coniferous forest, c. 1300 m elevation; cult. (LST-313 specimen grown in J. Rukšāns garden, Latvia), fl. 23 Aug. 2021, Rukšāns s.n. (holotype: GB!). The exact locality of *C. kackarense* has not been documented here for fear of unlawful plant collecting.

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Habitat. Described from the area of Northern Anatolian conifer and deciduous forests with such phytocenosis indicators as *Abies nordmanniana* (Steven) Spach and *Picea orientalis* (L.) Link; found in coniferous forest under the tree canopy, at 1300-2000 m elevation.

Mesophyte.

Conservation status. The preliminary conservation status of *C. kackarensense* was not assessed due to the insufficient data but it could be informally evaluated between Vulnerable and Endangered [14] by known number of its locations in the wild (Map 1).

Phenology. Flowering: not seen in the wild, presumably since September; August to September in cultivation; fruiting: not seen in the wild, presumably in May – June.

Etymology. Named after The Kaçkar Mountains in NE Turkey, where it was found.

Discussion

In our collections were or are still grown several samples labelled as *C. speciosum* and originally collected from known wild localities. These are plants with more less campanulate or broadly funnel-shaped white-centred perianth, uniformly coloured or tessellated segments. Colchicums from the Caucasus mountains were represented by two accessions.

The first one came from Dombay area in N Caucasus, Karachay-Cherkessia, Russia,

originally collected in 1983 by J.

Rukšāns at around 2100 m elevation and grown by him in open garden for more than 25 years.



Fig.9: *Colchicum speciosum* cultivated in the garden of J. Rukšāns; origin – Dombay, Karachay-Cherkessia, Russia (photo – J. Rukšāns).

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Another one is from Georgia (Racha-Lechkhumi & Kvemo Svaneti region) and was collected at 1260 m elevation during BARAKA expedition organized by Gothenburg Botanical Garden (Sweden) in 2007.



Fig.10: *Colchicum speciosum* BARAKA-062 cultivated in the garden of J. Rukšāns; origin – Racha-Lechkhumi & Kvemo Svaneti region, Georgia (photo – J. Rukšāns).

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Three gatherings were from Turkey – sample labelled as 'Ordu' originally was collected by B. F. Mathew & A. J. Tomlinson in 1965 (sample 4378), in south from Ordu town at 1300 m elevation (locality marked on attached Map 1 is very approximate when searching for appropriate altitudes near Ordu). In 2009 few samples were collected at 1700 m elevation along the old road to Zigana Pass at a clearing between trees where we stopped for lunch and higher on meadow, where one albino of *C. speciosum* was accidentally collected (below).



Fig.11: *Colchicum speciosum* f. Alba cultivated in the garden of J. Rukšāns; origin – Zigana Pass, Gümüşhane Province, Turkey (photo – J. Rukšāns).

In 2011 another sample was collected on Soğanlı Pass at 2500 m elevation, again in an open meadow (Fig. 12). All those samples, although something different, are well corresponded to *C. speciosum* species concept and their naming was never in doubt. By general features and overall view, they all looked quite similar and were labelled as *C. speciosum*, regardless of flower throat which in Caucasian samples is different from Turkish samples. More populations must be observed to make some conclusion about their status.



Fig. 12: *Colchicum speciosum* cultivated in the garden of J. Rukšāns; origin – Soğanlı Pass, Bayburt Province, Turkey (photo – J. Rukšāns).

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During a trip in May 2018 in Iran (18IRS expedition – J. Rukšāns, D. Zubov, H. Zetterlund, V. Jošt, ect.), we found fields of *C. speciosum* in huge quantities (below), along with *Galanthus transcaucasicus* Fomin, *Fritillaria kotschyana* Herb. subsp. *kotschyana*, *Crocus archibaldiorum* (Rukšāns) Rukšāns in alpine meadows at 2000 m elevation just before and at Asalem Pass in Gilan Province, NW Iran.



Figs. 13, 14 : *Colchicum speciosum* habitat shared with *Galanthus transcaucasicus*, *Fritillaria kotschyana* subsp. *kotschyana*, *Crocus archibaldiorum*, etc.; Gilan Province, Iran; May 2018 (photos – V. Jošt).





Fig. 15: An aspect of *Colchicum speciosum* flowering wild in Kuhha-ye Tales (Talysh Mountains), Gilan Province, Iran (photo – N. Malekzade).

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In the Flora Iranica, 1992 [18], *C. speciosum* is given for such Iranian provinces as Gilan, Mazandaran, Golestan, Ardebil, Qazvin and Semnan, growing in light woodland, wood margins, alpine meadows, moist grassy slopes, stream sides at 1200-3000 m elevation.



Figs.16, 17: *Colchicum speciosum* flowering wild in Kuhha-ye Tales (Talysh Mountains), Gilan Province, Iran (photos – N. Malekzade), above and below.

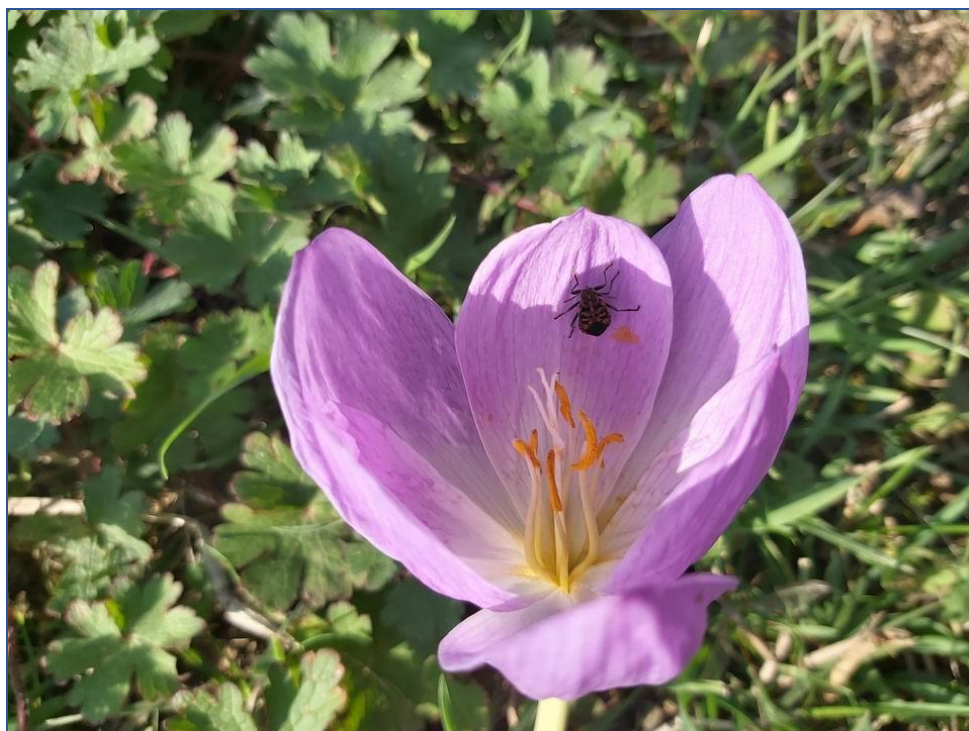




Fig.18: *Colchicum woronowii* flowering wild on Mt. Mamdzyshkha in Abkhazia, Georgia; September 2018 (photo – S. Banketov).

Considering our gatherings of *C. woronowii* samples we found it twice within W Transcaucasia at Black Sea coast. In April 2013 it was studied in vicinities of Krasnaya Polyana vill. in forest clearings at 700-800 m elevation in fruits and foliage (Krasnodar Territory, Russia).

The second time it was found flowering in September 2018 at the top of Mt. Mamdzyshkha at 1700-1800 m elevation in alpine meadows, above Gagra (Abkhazia, Georgia), where it bloomed along with the same rare Abkhazian endemic species of *Crocus autranii* Albov. In both populations, its corms had very dark brown lustrous 'lacquered' tunics, in contrast to the corms of *C. speciosum* with typical dull brown tunics observed in the same region and at the same period in the valley of Avadhara River at 1600 m elevation in riverside meadows and on northern slopes of the Berchil Ridge at 1500-1600 m elevation above forest zone (Abkhazia, Georgia; Figs.19, 22).



Fig.19: *Colchicum speciosum* flowering wild on northern slopes of the Berchil Ridge in Abkhazia, Georgia; September 2018 (photo – S. Banketov).



We also repeatedly observed typical *C. speciosum*, blooming in August-September in Dombay area in the Dombay-Ulgen Gorge and Alibek Gorge at 1800-1900 m elevation in riverside meadows (N Caucasus, Karachay-Cherkessia, Russia).

Fig.20: *Colchicum speciosum* flowering wild in Alibek Gorge, Dombay, Karachay-Cherkessia, Russia (photo – S. Banketov).

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Fig.21: The LST expedition international team: left to right – Henrik Zetterlund (Sweden), Arnis Seisums (Latvia), a Turkish soldier, Jānis Rukšāns (Latvia) and Gerben Tjeerdsma (Sweden) (photo – J. Rukšāns).

In 2005 our team of four persons: Henrik Zetterlund and Gerben Tjeerdsma from Gothenburg Botanical Garden (Sweden) and Arnis Seisums (National Botanical Garden of Latvia) and Jānis Rukšāns (Latvia) travelled through NE Turkey (Fig.21). During this expedition (the LST expedition: from Latvia, Sweden to Turkey, organized by Gothenburg BG) on 10-11, June 2005, our team visited The Kaçkar Mountains (formerly known as The Lazistan Mountains). By our rented car we could reach Barhal (or Altıparmak, or Parkhali), a remote and picturesque village built in a forest valley at the southern foot of Mt. Kaçkar, where our team split. As we had only one tent with us, A. Seisums and G. Tjeerdsma hired horses and went further in mountains up to the alpine zone, but H. Zetterlund and J. Rukšāns stayed in Barhal and explored the village vicinities.

At that time, we hadn't navigators and altitude recorders, so it was impossible to register exact localities for each accession. Seisums & Tjeerdsma reached the elevation of approx. 2700-3000 m, judging by the altitude illness which A. Seisums suffered after passing Karagöl (Black Lake) in vicinity of Naznara vill. They collected 22 samples of various bulbous and

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non-bulbous perennials, between those was a sample of *Colchicum sp.* LST-292, collected under trees at forest zone edge, but no exact data are known. According to notes made by A. Seisums (pers. comm.) it was somewhere near end of forest line, before alpine zone started at around 2100 m - 2200 m elevation (see Fig. 4).

The vicinity of village where Rukšāns and Zetterlund stayed was much less promising botanically relating to bulbous plants, our main target in this expedition. The mountain slopes were extremely steep and forested, so only at occasional spots was it possible to climb up from the road. There, under trees of coniferous forest, at approx. 1300 m elevation, some 10 m from the roadside another sample of *Colchicum sp.* (LST-313) was collected; (see Fig. 2). Both samples were collected in leaf as autumn-blooming species, so identification *in situ* was impossible. Both samples for the first time in cultivation bloomed in 2006 (blooming recorded in August, 25, 2006) and turned out to be quite confusing to determine. They were very similar, practically identical, and poorly associated with *C. speciosum*. During cultivation the names were changed several times and always large question sign was attached to the name. The main differences between plants regarded as typical *C. speciosum* and plants from the Kaçkar Mountains were in flower structure (distinctly narrower perianth segments and prominent, very large white flower throat) and smaller corm size (Fig.3) in the latter. In new species the lobes of a style are mostly shorter or not exceeding stamens (cfr. Fig.6), but in *C. speciosum* the styles somewhat or much exceed the stamens (cfr. Figs.7, 8). After discussion we decided that it is sufficiently morphologically different from *C. speciosum* to be regarded as different species. If *C. speciosum* in the wild (Caucasus, Georgia, in Turkey at Soğanlı and Zigana Passes as well as in Iran) was observed by us only on open meadows, both collected specimens from The Kaçkar Mountains (LST-313 & LST-292) were growing under large trees within a coniferous forest (a woodland habitat). We decided to name this new species as *C. kackarensis* after mountain range in NE Turkey where it was found growing wild.

Identification key of *C. kackarensis*, *C. speciosum* and *C. woronowii*

1. Corm tunics membranous, dark brown to reddish brown, glossy, 'lacquered'; narrow local Colchis endemic (W Transcaucasia: Georgia – Abkhazia; Russia – Krasnodar Territory, Adler

***C. woronowii* Bokeria**

2. Corm tunics membranous, yellowish brown to light or mid brown, dull

3

3a. Perianth segments distinctly narrow-oblongate, 50-58 mm × 8-15 mm; flower throat broad, white up to 2/3 of segments length; styles mostly shorter or not exceeding stamens; narrow local Lazistan endemic (Northern Anatolia: NE Turkey – Artvin Province, The Kaçkar Mountains)

***C. kackarensis* Rukšāns & Zubov**

3b. Perianth segments more or less broad, elliptic-oblong to obovate, 43-80 mm × 11-30 mm; flower throat white, much less, never reaching 2/3 of segments length; styles somewhat or much exceeding stamens

***C. speciosum* Steven**

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and patience during our trips and preparations of our publications.

Fig.22: Cultivated in Ukraine, *C. woronowii* and fallen plums (photo – D. Zubov).

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