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It is a pleasure once more to have an article by those two indefatigable independent researchers and plantsmen, from Latvia and Ukraine - Jānis Rukšāns, Dr. biol. h.c. and Dimitri Zubov, PhD. In this issue they address the subject of two new geophyte species in the Scilloideae subfamily (Asparagaceae).

Two species of bulbous geophytes growing in the Alborz and Zagros mountains in N and W Iran are described and illustrated. The differences between new species from the genera of *Puschkinia* and *Fessia* and taxa related to them are also discussed. Photographs and keys to the species identification and distribution maps are provided.

Cover image: *Puschkinia advayana* – photo by Jānis Rukšāns.

This issue is published early as a tribute to the 90th Anniversary of the Scottish Rock Garden Club.



Dimitri Zubov and Jānis Rukšāns in the habitat of *Crocus speciosus* agg. in Baydar valley, of Crimea, taken in October 2013.

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--- Species Description ---

Two new geophyte species in *Scilloideae* subfamily (*Asparagaceae*) from northern and western Iran

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Summary. New two species of bulbous geophytes growing in Alborz and Zagros mountains in N and W Iran are described and illustrated; the differences between new species from the genera of *Puschkinia* and *Fessia* and taxa related to them are discussed. Photographs, keys to the species identification and distribution maps are provided.

Key words: geophyte, *Puschkinia*, *Fessia*, *Scilloideae* subfamily, Zagros mountains, Alborz mountains, Flora Iranica.

Introduction

The genus Puschkinia

The genus *Puschkinia* Adams was described in 1805 from the Caucasus Mountains. Earlier included within *Liliaceae* Juss. family, now this genus is placed within [Asparagaceae Juss. family](#), *Scilloideae* Burnett subfamily. The genus was published by Adams who named this beautiful early spring bloomer after his travel partner Apollos Mussin-Pushkin [1]. Superficially it is fairly similar to the much larger genus *Scilla* L. *sensu lato* but differs in having a distinct perianth tube and flattened filaments extending into a 6-lobed corona that slightly exceeds the anthers. For a couple of centuries (1805 - 2007) the genus *Puschkinia* remained monotypic.

The only species, *Puschkinia scilloides* Adams, was described in 1805 by Russian naturalist, zoologist, and botanist Michael (Johann) Friedrich Adams from the southern-sided subalpine meadows of Mount Ararat (The Armenian Plateau). Because of its superficial similarity to squills, the species was named *P. scilloides* (scilla-like puschkinia) [1, 11, 13]. Interestingly, there is a scilla (now the genus *Fessia* Speta) named after puschkinias as well – *Fessia puschkinioides* (Regel) Speta [19].

Later two more *Puschkinia* species were described – *P. libanotica* Zucc. from Lebanon [22] and *P. hyacinthoides* Baker (hyacinth-like puschkinia) from W Iran [2]. Edmondson J. R. (1984) in Flora of Turkey merged them all together as *P. scilloides*, concluding that the great

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variability and lack of correlation between the characters did not allow maintaining them as separate species [4]. The name *P. hyacinthoides* could be restored, because in Iran there were observed the populations with unusually, really hyacinth-like flower spikes (on Kuhha-ye Tales ridge, between Nav and Khalkhal, where it was observed by the authors growing on steep mountain slopes at altitudes from 2080 m and higher, acc. no. WHIR-126). *Chionodoxa* Boiss. is another genus with a distinct tube and flattened filaments, but they lack the corona-like extension; now most botanists subsume them under the genus *Scilla* [19].



The raceme inflorescence of *Puschkinia scilloides* resembles a hyacinth (acc. WHIR-126, Iran).



Typical *Puschkinia peshmenii* (acc. no. Rix et al. 1624).

The first break happened in 2007 when Martin Rix and Brian Mathew published the new *Puschkinia* sp. from Turkey very different from *P. scilloides* (as well as from the later published *P. bilgineri* Yildirim) by the shape and colour of the flowers. This new species was reported as originally discovered in 1974 by Dr. Hasan Peşmen on the eastern flank of Pelli Dağgı (Alacabük Dağı), in the mountains between Tatvan and Van at the southern side of Lake Van [14, 20]. Those plants were shown to M. Rix and a few days later in Hakkâri Province, near the Turkish-Iranian border (Rix et al., acc. no. 1926), they discovered a similar

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small population among dwarf shrubs near Yüksekova, in the gorge leading into the valley from the west. Plants from Yüksekova were used in the description of the new species. It was named after Dr. H. Peşmen (who tragically died in a road accident in 1980) as *P. peshmenii* Rix & B. Mathew and was published in 2007 [14]. This sample must be regarded as typical *P. peshmenii*. Its progeny is the most widely grown in collections and it reproduces true from seed with no traces of hybridization with differently looking samples from other localities until recently considered as *P. peshmenii*. Its photo was published for the first time in 1981 in “The Bulb Book...” (p. 43) by M. Rix & R. Phillips as an unnamed, green-flowered variant of *P. scilloides* [15]. It occurs in the same area as the typical *P. scilloides*. Nonetheless, there are some discrepancies between collecting data published in Curt. Bot. Mag. where the new species was described and a label on herbarium sheet ([acc. no. 1926](#)). According to the isotype specimen, the accession no. 1926 was collected already in 1972, two years earlier than this species was for the first time seen by Dr. H. Peşmen (according to the data published in Curt. Bot. Mag.). The number used for the photo of a new species (acc. no. Rix 1624) in Kew herbarium register belongs to *Fritillaria caucasica* subsp. *syriaca* nom. spirit. and it was collected in 1970. In Rix & Phillips (1981) for the acc. no. 1926 there is given May, 1974, and the same picture has the collector’s no. Rix 1926 [15].

The same taxon, according to Rix & Mathew [14], occurs also in western Iran, near Shahpur, north-west of Lake Rezaieh, now renamed as Lake Urmia (Mathew et al., 1340), and in the Alborz Mountain Range (pictured by John Ingham – 10 km north of the road tunnel under the pass on the Karaj – Chalus road, at ~2000 m elevation, *pers. comm.*).



Puschkinia bilgineri in type locality – Karabet Pass, nr. Van city, Turkey (acc. no. JRRK-058).

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In 2014, Turkish botanist Hasan Yildirim published a taxon of *P. bilgineri*, also described from SE Turkey (Provinces of Van: Karabet Pass - Kavuşşahap (İhtiyarşahap) Dağları, and Hakkari: Yüksekova) [20]; and almost simultaneously, only nine days later, the same species from Karabet Pass was published by J. Rukšāns as *P. kurdica* Rukšāns [17]. Although publishers of *P. kurdica* had received a manuscript two months earlier than the publishers of *P. bilgineri*, the naming priority of course belongs to Yildirim's taxon, as it was published earlier. *Puschkinia bilgineri* superficially looks closer to *P. scilloides* but has a different shape of inflorescence and its seeds are black (*versus* yellowish seeds in *P. scilloides*).

During the joint Swedish-Latvian Expedition organized by Henrik Zetterlund from the Gothenburg Botanic Garden (abbreviated as BATMAN, or BATM) near the shores of Lake Van, 19 km after Tatvan on Tatvan-Van rd., our team made a stop in a short, very steep gully. We climbed some distance up to the few shrubs and in wet clayey soil under juniper and oak bushes and in nearby clearings we spotted several bulbous plants in flower. We collected two *Colchicum* L. species, *Muscari* Mill. sp., *Bellevalia* Lapeyr. sp., *Iris persica* L., *Fritillaria* cf. *crassifolia* Boiss. & A. Huet and *Puschkinia* already fruiting, labelled *in situ* as *P. scilloides*.



Typical gathering of *Puschkinia kurdistanica* from the shores of Lake Van, Turkey (acc. no. BATM-060).

It got the acc. no. BATMAN-060 and in 2009 was relabelled as "*P. peshmenii*, a whitish form" – a few plants had almost white flowers with darker tubes and midveins. Most of them were dirty blueish shaded, though not as light and bright as in *P. scilloides* - the colour was rather greenish, blue, somewhat dull, flowers were positioned on the slightly curved racemes, more conspicuous in the blueish-coloured plants.

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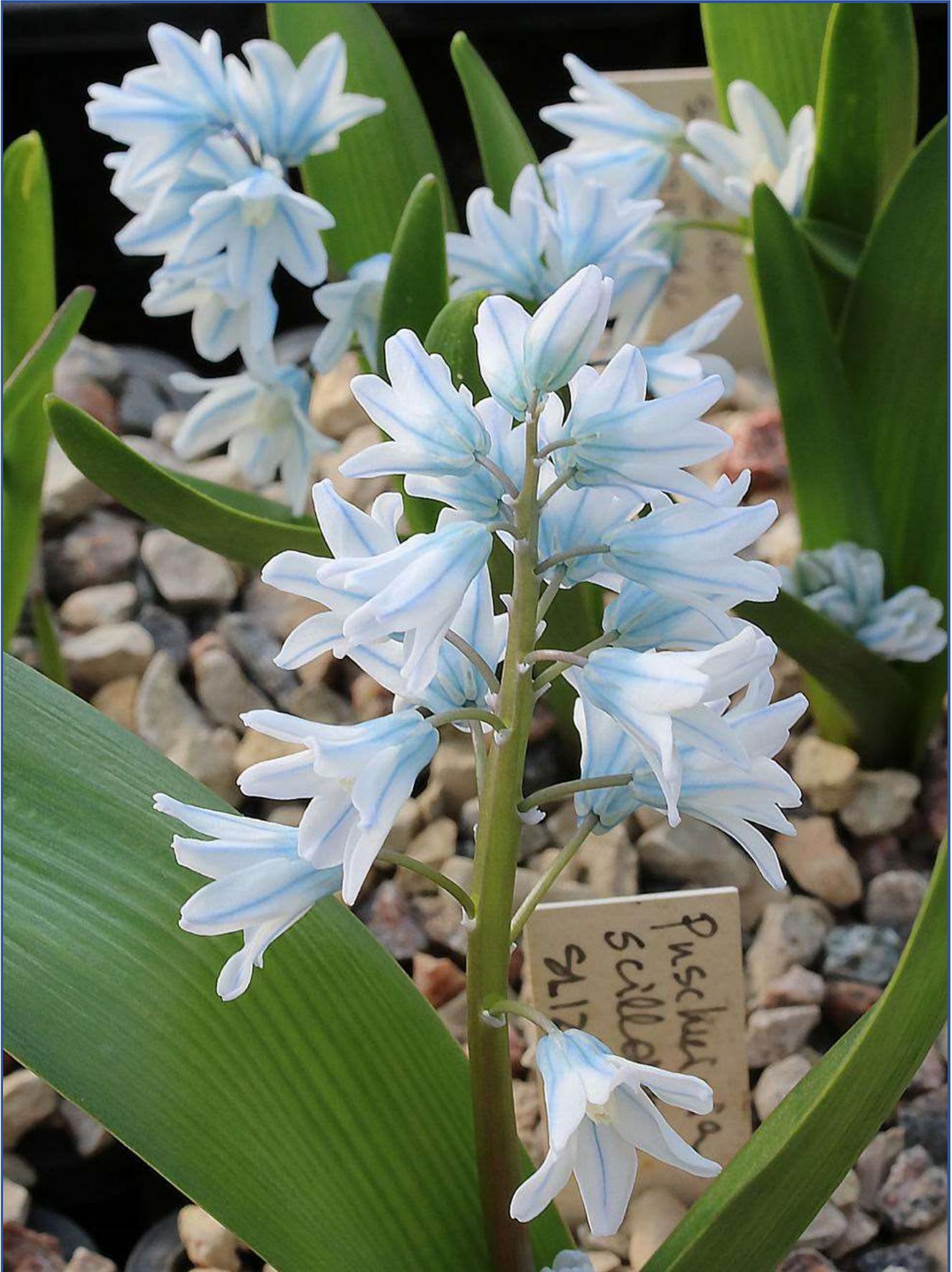
The most prominent traits were the very long lower pedicels, the lowest ones being mostly 30-40 mm long, occasionally even more than 50 mm long. Flowers were, for the greatest part, tubular, only slightly opened, and arranged in a dense raceme. Another feature separating this sample from the typical *P. peshmenii* was the style. In *P. peshmenii* it is well developed, c. 3 mm long, white and it remains attached to the capsule at maturity. In the acc. no. BATMAN-060 the style is reduced, less than 1 mm long, the upper part of the ovary gradually narrows towards the stigma and retains this shape until the capsule ripens. It was named and described in 2019 as *P. kurdistanica* Rukšāns from south-eastern part of The Armenian Plateau in E Turkey (Van Province: southern shoreside of Lake Van). Both latter ones have a quite restricted area of distribution.

In 2022, three new *Puschkinia* species (*P. avromanica* Rukšāns & Zubov, *P. latifolia* Rukšāns & Zubov, and *P. parvula* Rukšāns & Zubov) distributed in N, NW & W Iran were described and illustrated by J. Rukšāns and D. Zubov [16].



Puschkinia avromanica from the Avroman Mountain in the

Central Zagros, Kurdistan Province, Iran (acc. no. 18IRS-026) in the garden of D. Zubov.



Puschkinia latifolia from nr. Siah Bisheh vill., at the border between Mazandaran and Alborz Provinces (acc. no. SLIZE-066).



Puschkinia parvula from the south-western section of Lake Urmia basin, West Azerbaijan Province, Iran (acc. no. 22IRS-077) in the garden of D. Zubov.

The genus Fessia

The genus *Fessia* was separated from the aggregate genus *Scilla* by the Austrian botanist Franz Speta (1941-2015) in 1998 [19]. For a moment the genus possesses 13 species, such as: *F. assadii* Malekloo, Hamdi & Jouharchi, *F. bisotunensis* (Speta) Speta, *F. furseorum* (Meikle) Speta, *F. gorganica* (Speta) Speta, *F. greilhuberi* (Speta) Speta, *F. hohenackeri* (Fisch. & C.A. Mey.) Speta, *F. khorassanica* (Meikle) Speta, *F. olangensis* Zubov & Rukšāns, *F. parwanica* (Speta) Speta, *F. purpurea* (Griff.) Speta, *F. puschkinioides*

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(Regel) Speta, *F. raewskiana* (Regel) Speta, *F. vvedenskyi* (Pazij) Speta. At the same time the Russian botanist Helena Mordak considers all these taxa within the section *Fessia* (Speta) Mordak of the genus *Scilla* [12].

Speta has divided the genus *Scilla s.l.* into the many new genera and restored the generic status of some former genera (which were previously included in *Scilla s.l.*). Within *Scilla s.s.* remained all the species related to *Scilla bifolia* L. *Scilla s.s. fide Speta* swallowed the members of the genus *Chionodoxa* as well. Included earlier within the *Liliaceae* Juss. family, now this genus is placed to [Scilloideae](#) subfamily of [Asparagaceae](#) [19]. Not all botanists accepted such an extensive splitting. Several genera published by Speta in 1998 are now returned to *Scilla* (e.g., genus *Othocallis* sensu Speta with well-known species – *Scilla siberica* Andrews). In the International Plant Names Index (IPNI) the genus *Fessia* is regarded as different from *Scilla* (2023) and the World Checklist of Selected Plant Families (Kew Gardens, UK) supports the same viewpoint [5, 8].

Franz Speta characterised the genus *Fessia* as having comparatively small bulbs covered with silvery, whitish, brown or black to purple-violet tunics. Inner scales are white, living around 3 years. It produces thin, white and unbranched adventitial roots that live only one season. In most species 2-9 leaves are formed in early spring, excluding two species with leaves developing in autumn. Scapes are 1-4, semi-terete to slightly round-shaped, angular, bearing 2-20 flowers, erect to semi-erect and lying prone to the ground after the blooming until the fruit ripening. Bracts are irregularly shaped and always spurred. Flower segments are free, blue-violet to white; filaments are narrow, formed at a short distance above the base and bear ice blue to dark blue anthers. Ovary is globular to ovate with 2-6 ovules per locule, style clearly detached, and seeds are round, blackish-brown without elaiosomes and having a smooth testa. The distribution area of the genus *Fessia* stretches from Talysh mountains in Azerbaijan along the northern border of Iran and within Zagros mountain range (6 species) to north-eastern Afghanistan (4 species), NW Pakistan, entering NW India (1 species) and the former Soviet Central Asian republics – Tajikistan, Uzbekistan and Kyrgyzstan (3 species). In total at present there were 13 species recognised [19].

Materials and Methods

Field studies for *P. advayana* were undertaken in April 2017 and April 2022 in western Iran (Kurdistan Province), and living material in cultivation (Latvia, Ukraine) was examined by us between 2018 and 2023. Field studies for *F. gilanica* were undertaken in April 2016 and April 2022 in northern Iran (Gilan Province), and living material in cultivation (Latvia, Ukraine) was examined between 2017 and 2023. Herbarium specimens of other related puschkinia

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and fessia species were examined at K, RIG, GB and HSK herbaria (abbreviations after [7]). Measurements, colours, and other details are based on living material, herbarium specimens and data derived from field notes. Morphological 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 [3]. The distribution maps were plotted and produced using specimens and recorded coordinates and verified using Google Earth Pro (©2017 Google). The preliminary conservation status of *P. advayana* and *F. gilanica* were not evaluated against the Red List Criteria [9] due to the insufficient data on these new species full-range distribution. Most photos were taken by J. Rukšāns, and maps were generated by J. Rukšāns.

Puschkinia advayana
blooming in type locality –
Central Zagros, Kurdistan
Province, Iran.



Taxonomic treatment and discussion

The new Puschkinia species from the Zagros Mountains, Kurdistan Province of western Iran

In 2017 our team made a longer stop, due to car problems, on the road from Saqqez to Marivan at 1545 m elevation, between the villages of Darreh Ziarat-e Sofia and Mazojdar-E Sheykh 'abdollah (nr. Taleh Jar vill.). In some clearings between shrubs on a steep slope we observed a beautiful species of *Puschkinia* growing in dense grass. Although it somewhat resembled *P. peshmenii* there remained some doubt about identification and few bulbs were collected for further observation in cultivation (an accession no. 17IRS-048). In 2018 we revisited the same locality, but it was too late in season and not a single plant was seen within very dense and luxurious growing grass. So, in 2022 our team made a special side turn for one more visit to the known place to gather more representative samples and collect more morphological data just from the wild grown plants, and to prepare the type herbarium for potential use as holotype specimen.



Puschkinia advayana blooming in type locality.

In 2022, this *Puschkinia* sp. was found *in situ* in full bloom, showing two colour forms side by side – pure white and blueish shaded (an accession no. 22IRS-082). In 2023 we made detailed comparison using cultivated plants grown side by side under identical conditions to avoid seasonal and habitat associated fluctuations. For comparison fully developed mature plants gathered in Iran as early as in 2017 were used and plants of *P. peshmenii* cultivated

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since 2006. Acquired data confirmed that plants collected in Iran under acc. no. 17IRS-048 and 22IRS-082 belong to another new *Puschkinia* species, which is sufficiently different from *P. peshmenii* and growing 250 km to south-east from the *locus classicus* of *P. peshmenii*.

As independent researchers, we have no access to molecular & genetic analysis tools, so it remains for us to check morphological characters, habitat ecological conditions, breadth of distribution area and, lastly, the possibility of interspecific hybridization between different plant samples/species/races. During our expeditions to Armenia, Georgia, Turkey, Iran we always collected few samples of *Puschkinia* in different localities (sample accessions). This allowed us to compare various populations in cultivation by growing all accessions side by side under identical conditions and regularly collecting and sowing seeds separately. In such a way we checked how constant the features are from studied populations, and how they are stable through the generations. Those observations allowed us to separate different *Puschkinia* accessions from poorly studied Iranian localities, which are easily distinguishable from other specimens and keep their specific features through several progenies reproduced via open pollination.



Puschkinia advayana blooming in type locality – Central Zagros, Kurdistan Province, Iran.

Blueish-flowered form of *P. advayana*
in type locality– Central Zagros, Kurdistan
Province, Iran.



Therefore, completely based on our comparative data obtained from the puschkinia cultivated plants of different origin, we describe here below our newly found Iranian puschkinia as a new species under the name:

***Puschkinia advayana* Rukšāns & Zubov sp. nov.**

Type: Iran, Kurdistan Province: near road from Saqqez to Marivan, between Darreh Ziarat-e Sofia vill. and Mazojodar-E Sheykh'abdollah vill., within deep grass on clearings between sparse shrubs on steep slope, 36°00'N, 46°19'E, 1545 m elevation, fl. 12 Apr. 2022, *Rukšāns* s.n. 22IRS-082 (holotype RIG!).

Bulb – up to 20 mm in diam. and c. 25 mm long, ±ovate with a pointed apex, covered with previous years' dark greyish brown tunics, inner tunics greenish white; adventitious roots white, unbranched.

Leaves – 2, dark green, at the very base dirty lilac, ribbed, widening in direction to top, longer than flower spikes, reaching 20-24 cm length and 25-30(-32) mm wide in the widest part, at the top quite abruptly narrowing to pointed tip, hooded.

Scape – 1, erect, sometimes slightly curved, 15-18 cm long, bright green; *raceme* simple, dense.

Flowers – 11-27, ±campanulate, up to c. 15 mm long and c. 17 mm wide.

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Perianth segments – 6, connate at the base to form a tube c. 1/2 of a perianth length; *perianth tube* 6-8 mm long; *segment free parts* ovate, mostly \pm of the same length or only rarely slightly longer – 5-7(-9) mm long and 4-5 mm wide, white with greenish or blueish midrib, a tube abaxially greenish-blueish-greyish; *pedicels* \pm equal, erecto-patent to patent, green to blueish-green, 9-12 mm long, elongating during seed ripening and becoming distinctly patent; *bracts* obsolete, \pm bifid, white to whitish-lilac, membranous.



Flowers of *Puschkinia advayana*.

Androecium – *stamens* 6; the bases of the stamens flattened and closely clustered in the \pm middle of a perianth and connate to form a conical, white, 6-lobed *corona* c. 5 mm long; *corona lobes* (alternating with stamens) 1-1.5 mm long, irregularly and shallowly dentate at the top; *filaments* obsolete, white, less 1 mm long; *anthers* epipetalous, adnate adaxially between the very base of corona lobes, sessile, dorsifixed, versatile, introrse, narrow ovoid, c. 2 mm long, straw yellow; *pollen* straw yellow.

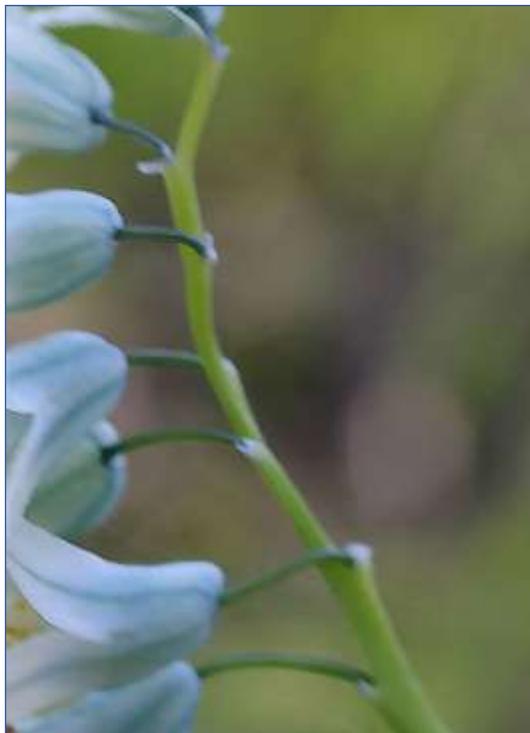
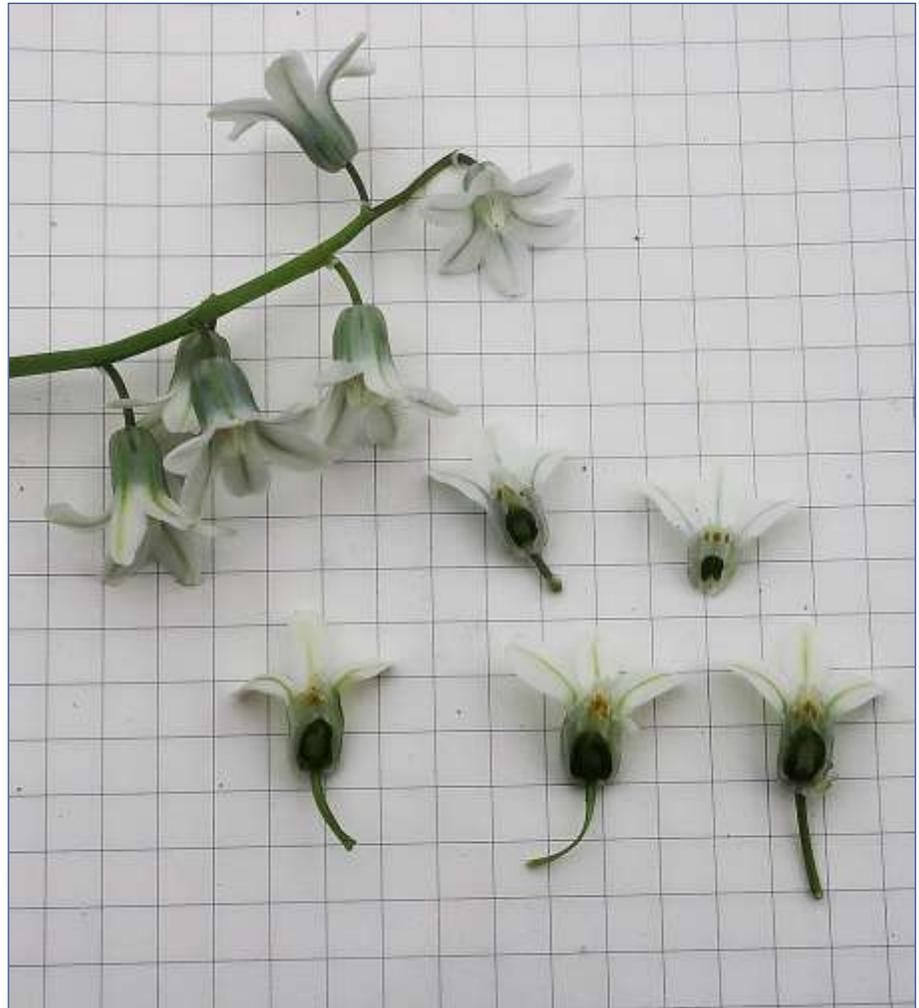
Gynoecium (ovary and receptacle) – syncarpous, trilocarpellate; *ovary* superior, sessile, elongated, ovoid, 3-4 mm wide and c. 5 mm long, indistinctly 3-ribbed, green, 3-4 mm in diam.; placentation axile, ovules numerous per locule; *style* \pm short, erect, 6-8 mm long, almost reaching tips of anthers and sometimes even overtopping them, white, greenish at the base; *stigma* small, white, capitate.

Fruit – a membranous, loculicidal *capsule*: c. 17 mm long and c. 15 mm in diam., \pm spherical, slightly 3-ribbed with a little beak at the top, straw green and persistent faded perianth and style.

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Seeds – ±ovoid, up to 4 mm long and 2.5-3 mm wide; *testa* pale golden brown, alveolate, glabrous.

The raceme inflorescence and flowers of *Puschkinia advayana*.



Bracts of *Puschkinia advayana*.

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The abaxial side of a flower of *Puschkinia advayana*.

Recognition – morphologically similar to *P. peshmenii*; the reliable features allowing the separation of typical *P. peshmenii* from *P.*

advayana sp.n. is the width of leaf blade and a ratio between length of flower tube and free part of flower segments, as well as shape and dimension of flower segments; the leaf blade width in cultivated plants of *P. peshmenii* never exceeds 18 mm (only 5-15 mm in plants in the

wild), but in *P. advayana* sp.n. it reaches sometimes 30 mm (for plants observed in the wild – 20-25 mm); the free part of flower segments in *P. peshmenii* usually 3x longer than a flower tube, rarely twice as long, whilst in *P. advayana* sp.n. they are of the same length, sometimes tube is even longer, very rarely segments longer, but never more than twice as long as the

flower tube; the free part of segments in *P. peshmenii* is narrow, ± lanceolate, 7-8 mm long and c. 3 mm wide, but in *P. advayana* sp.n. they are distinctly wider, ovate, 5-7 mm long and 4-5 mm wide.

Corona structure of *Puschkinia advayana*.



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Ovary, style and anthers of *Puschkinia advayana*.



Bulb tunics from the previous years of *Puschkinia advayana*.



Cleaned bulbs of *Puschkinia advayana*.

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Distribution – Western Asia: Iran, central section of the Zagros Mountains; possibly distributed much wider within NW Zagros area (Map 1).

Specimens examined – Iran. Kurdistan Province: near road from Saqqez to Marivan, between Darreh Ziarat-e Sofia vill. and Mazojodar-E Sheykh'abdollah vill., within deep grass on clearings between sparse shrubs on steep slope, 36°00'N, 46°19'E, 1545 m elevation, *fl.* 12 Apr. 2022, *Rukšāns* s.n. 22IRS-082 (holotype RIG!). The exact locality of *P. advayana* has not been documented here for fear of unlawful plant collecting.

Habitat – large clearings on steep slopes, under shrubs, in stony, very wet clayey soil within rich grassland vegetation (*Geranium* L. *sp.*, *Galium* L. *sp.*, *etc.*) together with other geophytes: *Allium* L. *sp.*, *Bellevalia paradoxa* (Fisch. & C.A. Mey.) Boiss., *Colchicum* L. *sp.*, *Corydalis haussknechtii* Liden, *Eranthis kurdica* Rukšāns, *Scilla* cf. *siberica* subsp. *caucasica* (Miscz.) Mordak, *etc.*).



Holotype specimen of *Puschkinia advayana* 22IRS-082 housed in the herbarium of the University of Latvia, Riga (RIG).

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MAP 1. Distribution map of some members from the genus *Puschkinia* (earlier treated as *Puschkinia peshmenii* aff.) in Iran and Turkey: deep purple mark – *P. peshmenii*, acc. no. Rix-1926, a type locality; red mark – *P. advayana*, a type locality; green marks – localities of *P. cf. advayana* found by Mahfouz Advay, but not visited by authors; yellow mark – locality of *P. cf. advayana* in Turkey, acc. no. BATM-250.



The raceme inflorescences of, left to right, *Puschkinia advayana*, *P. peshmenii* 'Rix form' and *P. cf. peshmenii* acc. no. BATM-250.

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Conservation status – the preliminary conservation status of *P. advayana* was not assessed due to the insufficient data, but it could be informally evaluated between Vulnerable and Endangered [9] by known number of its locations in the wild (Map 1).

Phenology – flowering in the wild: April; fruiting in the wild: May.

Etymology – named after Iranian botanist Mahfouz Advay, who found this species independently from our team. He is PhD student of plant systematics in Tehran University and has been working on the taxonomy and phylogeny of the genus *Fritillaria* L. in Iran for several years.

It seems that the same *Puschkinia* species could have been observed by Mahfouz Advay in Ghorveh, Baor-o-Parishan Mt. at 2400 m elevation (35°00'N, 47°49'E; HSK specimen no. 12588!) and on Avalan Mt., between Sanandaj and Kamiaran at 2600 m elevation (35°02'N, 46°52'E; HSK specimen no. 12685!), although they are smaller in size and have less flowers, but of same shape and density of flower spike, which could be explained by much higher growing conditions (HSK – Herbarium located in Kurdistan Agricultural and Natural Resources Research and Education Center, Sanandaj, Kurdistan Province, but not listed in Index Herbariorum).

During the previously mentioned BATMAN expedition in 2004, our team discovered another white flowered *Puschkinia* sp. of the habitus quite similar to the here described *P. advayana*. A good batch of seeds were collected in E Turkish Bingöl Province, some 12 km to the east of Bingöl city in Turkey, at an altitude ~1500 m, almost 400 km to the north-west from the *locus classicus* of *P. peshmenii*. We stopped by side of a small road. Henrik Zetterlund and Jānis Rukšāns explored its right side, while Arnis Seisums from the National Botanic Garden of Latvia took his boots off and crossed a small river on its left side. There were dense shrubs with cattle paths on either side of the road. Arnis returned with a few bulbs of an *Ornithogalum* L. sp. (it turned out to be a new species) and a good number of seeds (an accession no. BATMAN-250), which he regarded belonging to *P. scilloides*, at that time the only species in the genus. When its seedlings grew up and bloomed in our collections for the first time, it happened that it was closer to *P. peshmenii* than to *P. scilloides*. In the trade that accession is offered under the name of *P. peshmenii* 'Jim Archibald' and according to the seller's information, it was found for the first time during another earlier trip by Stevens, Archibald & Seisums (an abbreviation – SASA). It has gorgeous pure white flowers without any blue or greenish hue. Only on the base of the midribs of the buds as they are opening, is there a tiny blue-green tint. The flowers were

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positioned on short pedicels, being campanulate, and less pendant, than in typical *P. peshmenii*. If not the differences in the corona structure, the longer flower tube and the even shorter free part of the segments, we would regard them identical with our Iranian acc. no. 17IRS-048. Yildirim H. [20] from around the same locality (but a little closer to Bingöl) at an altitude of 900 m, cited the herbarium specimen of *P. scilloides*, which our newly found plant certainly was not.



Cultivated plant of *Puschkinia advayana* from *locus classicus* (acc. no. 17IRS-048).

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During that trip we had no GPS tracker, so the exact point and altitude, where Arnis collected the seeds, remain unknown: probably, it was around 1300-1400 m elevation. Its flowers look creamy white as the yellow pollen shines through the white corona. It is very floriferous, reaching 20 cm height. In cultivation it is later to emerge in the spring than *P. scilloides* and *P. peshmenii*. To decide about its taxonomical status, there need to be more observations and comparison with the related species. Although, superficially it resembles more *P. advayana* sp.n., its distribution area is so far from Iran, means its real identity could be quite doubtful to set up, although presence of disjunctive areas interspaced with other related species' areas is not unique (for example – *Crocus reticulatus* Steven ex Adam complex [6]). This case could be regarded as an exceptional situation and it needs more detailed studies.

Taxonomical status of plants pictured by John Ingham at 2000 m elevation by the Karaj – Chalus road, was not checked as well as plants from western Iran, near Shahpur, north-west to Lake Urmia (Mathew & al., specimen no. 1340).



Puschkinia peshmenii in cultivation (acc. no. Rix & al. 1624).

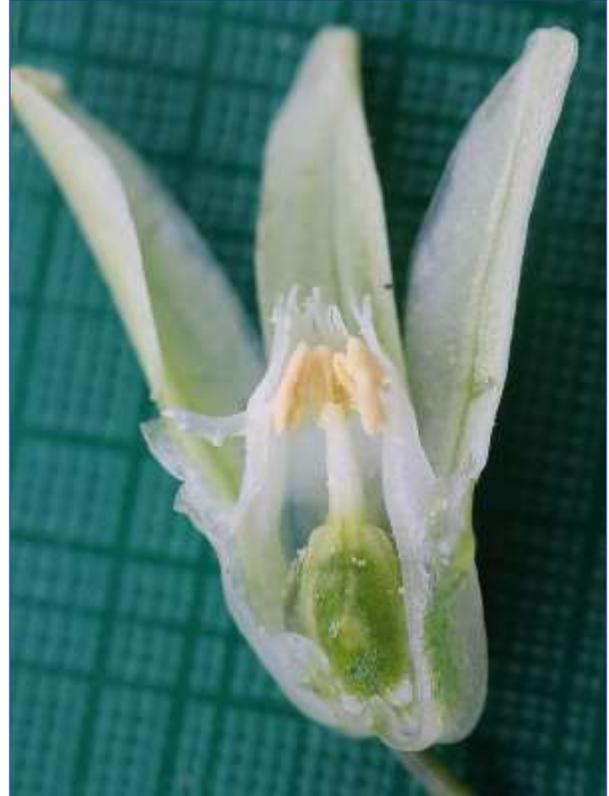
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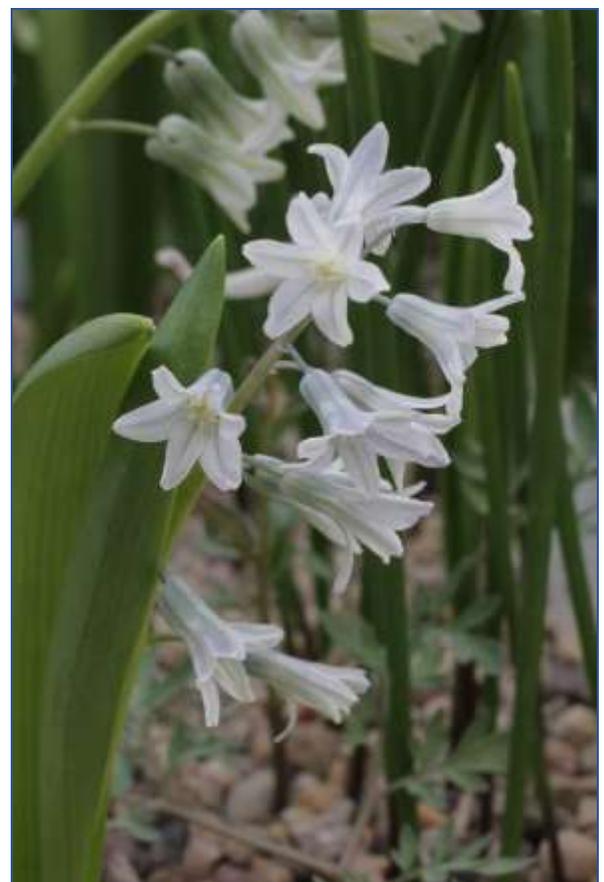
Puschkinia peshmenii flowers (acc. no. Rix & al. 1624).



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Puschkinia peshmenii flower corona and style (acc. no. Rix & al. 1624).



Puschkinia cf. *peshmenii* from near Bingöl, Turkey (acc. no. BATM-250).

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Above & below: *Puschkinia* cf. *peshmenii* corona (acc. no. BATM-250).



Above, left: *Puschkinia* cf. *peshmenii* bracts (acc. no. BATM-250).

In general, eight *Puschkinia* species are already known within the previously monotypic (until 2007) Western Asian genus, including the new one described here from W Iran [16]:

- *P. scilloides*: Taurus Mountains, Armenian Plateau – Turkey: E & SE Anatolia, Armenia; Near East/Levant – Syria, Lebanon; Ciscaucasia – S Russia: Stavropol Krai; E Caucasus – S Russia: Dagestan; Greater & Lesser Caucasus, Transcaucasia, Talysh – Georgia, Armenia, Azerbaijan; Iranian Plateau: Zagros mountains & Alborz mountains, Algurd Dagħ, Kuh-e Varvasht, Sahand Mt., Takht-e Soleyman Massif, Kiyamaki Dagħ, Alvand Kuh, Rasvand Mts., Kuhha-ye Sabalan – N Iraq, N & NW Iran;

- *P. peshmenii*: eastern end of the Taurus mountains (Bitlis Dağları, Hakkari Dağları) – Turkey: E Anatolia (Van & Hakkari Provinces);

- *P. bilgineri*: eastern end of the Taurus mountains (İhtiyarşahap (Kavuşşahap) Dağları) – Turkey: E Anatolia (Van Province);

- *P. kurdistanica*: south-eastern part of the Armenian Plateau (southern shoreside of Lake Van) – Turkey: E Anatolia (Van Province);

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- *P. avromanica*: Zagros Mountains (Central Zagros: the Avroman mountainous region) – W Iran: Kurdistan Province;
- *P. latifolia*: Alborz mountains (Central Alborz) – N Iran: Māzandarān & Alborz Provinces border area;
- *P. parvula*: north-western end of the Zagros mountains (south-western & western sections of Lake Urmia basin) – NW Iran: West Azerbaijan Province;
- *P. advayana*: Zagros Mountains (Central Zagros) – W Iran: Kurdistan Province.

Key to the identification of *Puschkinia* species

- 1 Inflorescence hemispherical to conical, corona with entire edge ***P. bilgineri***
- 1 Inflorescence pyramidal to cylindrical, corona with lobed edge
 - 2 Flower raceme ±curved
 - 3 Flowers greenish, pedicels 2-7 mm long, pending, raceme with slightly bent tip, curved back ***P. peshmenii***
 - 3 Flowers blueish to lilac blue, pedicels 7-50+(lowest) mm long, raceme curved ***P. kurdistanica***
 - 2 Flower raceme straight, pedicels up to 20 mm long, spreading
 - 4 Leaves less than 20 mm wide
 - 5 Free part of segments of almost same length or less than twice as long than tube, ovary rounded
 - 6 Flowers 1-4(-5) on scape, up to 17 mm in diameter, style violet at base ***P. avromanica***
 - 6 Flowers up to 8-10 on scape, up to 8 mm in diameter, style throughout white or greenish at base
P. parvula
 - 5 Free part of segments at least 2.5-3 times longer than tube, ovary elongated, ovate ***P. scilloides***
 - 4 Leaves more than 20 mm wide
 - 7 Lower pedicels 15-20 mm long, free parts of a perianth c. 3-times longer than tube ***P. latifolia***
 - 7 Lower pedicels 9-12 mm long, free parts of a perianth equal or only slightly longer than tube ***P. advayana***

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The new *Fessia* species from the Alborz Mountains, Gilan Province of northern Iran

In 2016 our team travelled along southern coast of Caspian Sea exploring the ecoregion of Caspian Hyrcanian mixed forests in the central section of Alborz mountain range. On 19th of April 2016 we made short stop at 1010 m elevation where it was possible to park our car for lunch after turn to the east from Rostamabad city.



The habitat of *Fessia gilanica*, Central Alborz, Gilan Province, Iran.

The slopes in general were covered by forest of small trees under which we spotted a lot of *Erythronium caucasicum* Woronow leaves but on cattle passes there were plenty of *Crocus* cf. *speciosus* M. Bieb. as well. Later it turned out that together with *C.* cf. *speciosus* there were collected few corms of *C. caspius* Fisch. & C.A. Mey. as well. Between all plants there were collected very few (each author had only one bulb) scilla-like bulbs, registered in travel diary as *Scilla* cf. *siberica* subsp. *caucasica* (we didn't note then the difference in bulb tunics' colouration). Main attention was given just to crocuses and erythroniums, we supposed that last could be different, new species, but later this hypothesis was not confirmed. The question still remains about taxonomical position of gathered crocus species from *C. speciosus* group. Likewise, in the same year of 2016 at Olang Pass in NE Iran we had already found a new *Fessia* species, which was published by us in 2019 under the name of *F. olangensis* Zubov & Rukšāns [21].

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Fessia gorganica: left – acc. from Brian Mathew, right – acc. no. 16IRS-093.



Fessia olangensis: left – acc. no. 16IRS-052, right – acc. no. WHIR-093.

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In 2019 the collected bulb of this so named “scilla” bloomed for the first time in our collections and it turned to be a very special representative of the genus *Fessia*. Having only one bulb of this plant in each collection, it was impossible to make any decision about its taxonomical status and variability. So, its locality was revisited in spring 2022. During those years the forest was cut down and replaced by shrub-like vegetation, giving more open spots where both *Erythronium* and *Fessia* simply flourished. By their leaves, all plants were close to the end of vegetation, so it was possible to collect well matured bulbs of that *Fessia* sp. for further observation under cultivation conditions in author’s gardens. The collected plants already bloomed in the following spring and turned out to be very uniform by all features, allowing us to decide that they belong to the new species, easy separable from other *Fessia* members at first by flower colour being distinctly purplish/pinkish violet shaded, whereas closely related *F. gorganica* and *F. olangensis* [21] have flowers of clear blueish (without any shade of violet/lilac) to white shades. The new species has very distinct bracts: at the base of the lower flower pedicels the bract is distinctly lingulate and up to 10 mm long, but gradually becoming shorter in direction to the upper flowers. In the same region *F. greilhuberi* is distributed, but the latter forms its foliage from autumn, whilst the new species described here below starts its vegetation only in spring and in cultivation blooms much earlier.

Thereby, a *Fessia* species we found in 2016 in N Iran deserves to be described as a new species under the following name:

***Fessia gilanica* Zubov & Rukšāns sp. nov.**

Type: Iran, Gilan Province, along the road from Rostamabad city to Kelishom vill., in broadleaf forest, 36°49’N, 49°39’E, c. 1010 m elevation; cult., fl. 17 Mar. 2023, *Rukšāns* s.n. (holotype RIG!).

Bulb – flat-globose, up to 25 mm in diam., in cultivation distinctly larger c. 35 mm in diam.; bulb tunics dark greyish to yellowish brown; adventitious roots white, unbranched.

Leaves – up to 5, smooth, slightly channelled, dark green with greyish hue, up to 20 cm long and 2 cm wide, ±parallelly edged, narrowing only to the top where becomes distinctly thickened and at very top slightly concave with down turned tip.

Scape – up to 3, weak, glabrous, spreading at anthesis, lying when fruiting, dirty brownish green with anthocyanin hue, up to c. 20 cm long, somewhat flattened in the basal part with ±two quite indistinct ribs; *raceme* simple, lax.

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Flowers – (1-)6-10, broadly campanulate to star-like when fully open, 16-18 mm long and c. 16 mm in diam.

Perianth segments – 6, in two whorls, up to c. 17 mm long and c. 8 mm wide, pinkish-violet/lilac with blue midvein abaxially; adaxially similar in colour to the abaxial side with more prominent blueish midvein; attached to the ovary when faded; *pedicels* glabrous, curved down, violet to dirty lilac, in upper flowers pedicels lighter and more lilac; lower pedicels up to c. 40 mm long, gradually shortening in direction to the top; *bracts* in lower flowers green toned, slightly curved, lingulate, up to c. 10 mm long, gradually becoming shorter in direction to the top, up to c. 2 mm on very top, where becomes dirty greenish with lilac upper rim.

Androecium – *stamens* 6, in two whorls; *filaments* less than 1 mm wide at base and gradually narrowing to the top, in outer whorl 7-8 mm long, in inner whorl 5-6 mm long, white, glabrous; *anthers* versatile, introrse, up to 2-3 mm long, very dark, even blackish or dark greenish blue; *pollen* dark blue.

Gynoecium (ovary and receptacle) – syncarpous, tricarpellate; *ovary* superior, slightly pear-like (narrower at bottom), dark green, triangular in cross section, placentation axile, ovules up to 6 per locule; *pistil* filiform, style white, at base slightly blueish or lilac throughout, straight or curved, remains attached to seed capsule almost to seed maturity, up to 11 mm long; *stigma* white, capitate.

Fruit (capsule) – at maturity triangular in cross section, ±globose, up to 8 mm in diam., dark green with an anthocyanin hue.

Seeds – round, up to 2.5 mm in diameter, very deep purplish black with prominent rapha.

Recognition – morphologically similar to *F. gorganica* but differs by having leaves with greyish hue (glaucous), lower pedicels c. 40 mm long, bracts lingulate c. 10 mm long, flowers pinkish-violet/lilac and yellowish-grey bulb tunics (vs leaves with no greyish hue (bright green), lower pedicels 8-16 mm long, bracts spurred, irregular c. 2 mm long, flowers white to blue and bulb tunics distinctly purple in *F. gorganica*).

Distribution: Western Asia: Iran, central section of the Alborz mountain range; possibly a narrow local endemic of Gilan Province, at present known only from one locality (Map 2).

Specimens examined – Iran. Gilan Province, along the road from Rostamabad city to Kelishom vill., in broadleaf forest, 36°49'N, 49°39'E, c. 1010 m elevation; cult., fl. 17 Mar. 2023, *Rukšāns* s.n. (holotype RIG!).

Habitat: broadleaf forests and woodlands (*Carpinus betulus* L., *C. orientalis* Mill., and *Quercus macranthera* Fisch. & C.A. Mey. ex Hohen.), among shrubs, in clearings, growing together with *Primula* L. sp., *Erythronium caucasicum*, *Crocus* cf. *speciosus* and *C. caspius*.

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Conservation status – the preliminary conservation status of *F. gilanica* was not assessed due to the insufficient data, but it could be informally evaluated between Vulnerable and Endangered [9] by known number of its locations in the wild (Map 2).



MAP 2. Distribution map of some members from the genus *Fessia* in Iran: red mark – *F. gilanica*, a type locality; yellow mark – *F. olangensis*, a type locality; green marks – localities from where *F. gorganica* was observed during authors' field works.

Phenology – flowering in cultivation: February - March; fruiting in cultivation: April-May.

Etymology – the specific epithet is generated from the name of Gilan Province in northern Iran, where this species was found.

Fessia gilanica.



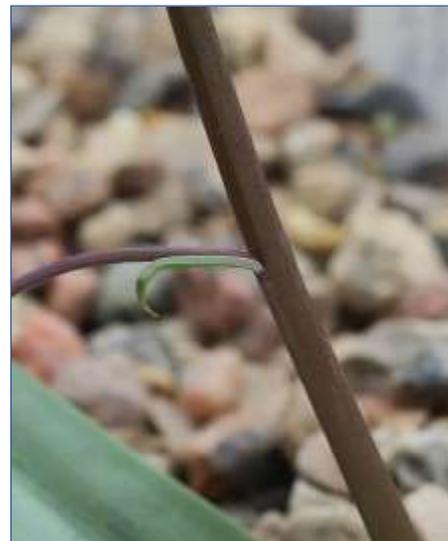
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Fessia gilanica



Long bracts of *Fessia gilanica*.



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A simple raceme of *Fessia gilanica*.



Flower details of *Fessia gilanica*.

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Flower details of *F. gilanica*.



Flower details of *Fessia gilanica*.

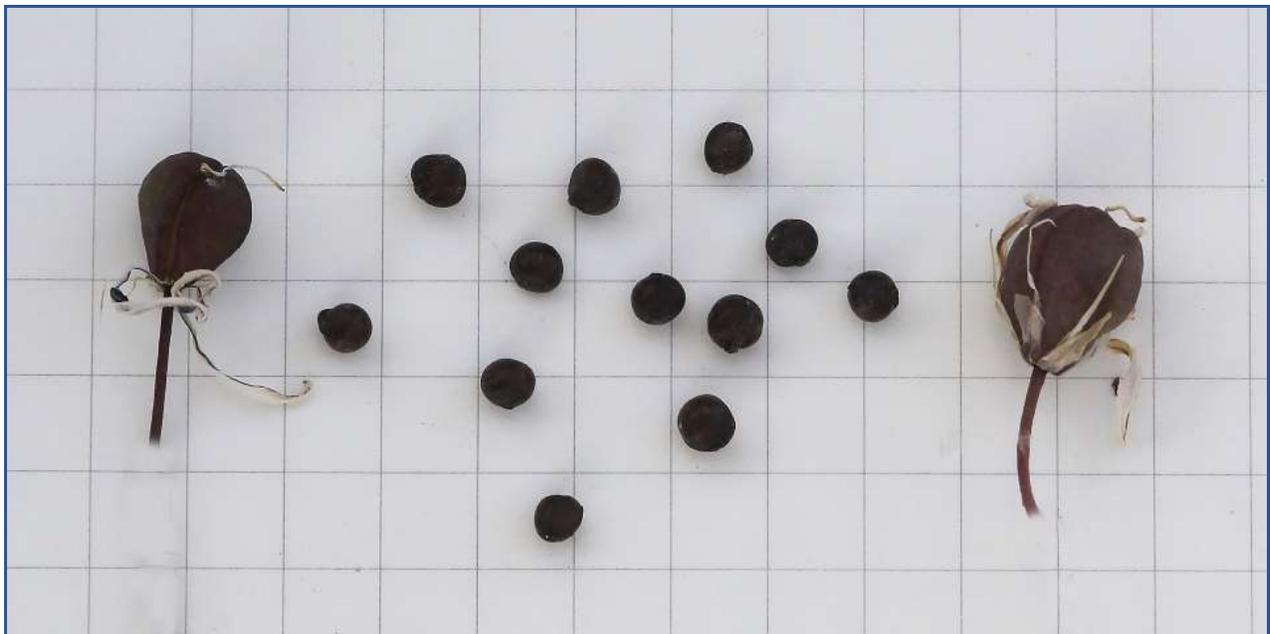


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Left, above: Leaf of *Fessia gilanica* at flowering time.

Right, above: *Fessia gilanica* capsules shortly before ripening



Fessia gilanica - capsules and seeds.

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Key to the identification of the genus *Fessia* species

1 Leaves appear in autumn

2 Scape with 4-10 light purple flowers, style 9-12 mm long, filaments 10 mm long, flower segments 15-20 mm long *F. greilhuberi*

2 Scape with 10-20(-25) flowers, style 6-7(-10) mm long, filaments 7-8 mm long, flower segments 12-15 mm long *F. purpurea*

1 Leaves appear in spring

3 Flower segments white with dirty blue midrib, (8-)10-13 mm long, style 6-8 mm long, pedicels 1.5-3 mm long *F. puschkinioides*

3 Flower segments lilac purple, blueish

4 Bulb tunics purple

5 Flower stem one, erect, with 2-10 flowers on 3-6 (-10) mm long pedicels, flower segments 8-12 mm long, style 5-8 mm long, filaments 6-8 mm long, flowers distinctly blue.

F. khorassanica

5 Flower stems more than one, recumbent, pedicels 8-16 mm long, flower segments (12-)15-17 mm long, style 7-9(-10) mm long, filaments 8-10 mm long, flowers blueish, less often white *F. gorganica*

4 Bulb tunics silvery grey or light brown, leaves up to 3 mm wide

6 Flower segments 9-10 mm long, bulb tunics light brown

F. parwanica

6 Flower segments 14-21 mm long bulb tunics silvery grey *F. raewskiana*

4 Bulb tunics whitish, greyish or light brown but not purple, leaves distinctly wider than 3 mm

7 Scapes with nodding tips, pedicels (5-)7-17(-25) mm long, down turned *F. vvedenskyi*

7 Scapes erect or spreading without nodding tips

8 Flowers distinctly purple or lilac shaded

9 Leaves 4-6 mm wide *F. furseorum*

9 Leaves up to 20 mm wide..... *F. gilanica*

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8 Flowers light to pale blue or blueish

10 Leaves 6-9(-12), flowers remain half-open

F. bisotunensis

10 Leaves 2-6, flowers open star-like

11 Scapes erect ***F. assadii***

11 Scapes spreading

12 Flowers 4(-5), pedicels up to 8 mm

long ***F. olangensis***

12 Flowers 2-7, pedicels 10-25 mm

long ***F. hohenackeri***

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