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NATALIJA AGAPOVA

## ***Ornithogalum gabrielianae* (Hyacinthaceae), a new endemic species from Armenia**

### **Abstract**

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*Ornithogalum gabrielianae* (*O.* subg. *Ornithogalum* s.l.) from Mount Aragatz, Armenia, is described as a species new to science, illustrated, and compared to its allies *O. hyrcanum* and *O. bungei*.

### **Introduction**

In 1929 Grossheim described *Ornithogalum hyrcanum* based on specimens from Talysh, Azerbaijan, collected by Radde and himself. Besides the original collections only few specimens of *O. hyrcanum*, collected in 1915 and 1946, were known when I was lucky to find plants on the Aragatz mountain, Armenia, in 1963 that seemed to match this species. Subsequently, the structure of the bulb, the ovary and the immature capsule were investigated, the chromosomes counted ( $2n = 58$ , Agapova 1967), and some quantitative characters measured in the field (i.e., in 100 plants, the height of the scape, the length and width of the leaves, the number of flowers, and, in 20 plants, the length of the lower pedicel and bract, the length and width of the tepals in the lower flower).

Then, in 1980, the herbarium of the V.L. Komarov Botanical Institute (LE) was enriched with some interesting *Ornithogalum* material from the Yardymly district, Azerbaijan. After its examination I realized that these plants actually represent *O. hyrcanum*, whereas the Armenian plants from the Aragatz mountain apparently belong to a different, hitherto undescribed species, which is described as *O. gabrielianae* here.

***Ornithogalum gabrielianae* Agapova, sp. nova** – Figs 1–2, 4b, 5a, 6.

Holotypus: Armenia, mons Aragatz, supra limitem superiorem querceti rari 2600 m.s.m. 12.6.1977, *E. Gabrielian* (ERE; isotypi: B, ERE, K, LE). – Paratypi: Armenia, distr. Aschtarak, ascensus ad montem Aragatz, c. 2300–2500 m, 1.6.1963, *N. Agapova* (LE); *ibid.*, supra limitem superiorem silvae, in declivibus apricis, 13.5.1971, *E. Gabrielian* 100385 (ERE).

A speciebus affinibus *O. hyrcano* Grossh. et *O. bungei* Boiss. notis morphologicis differt: a *O. hyrcano* bulbo elongato sursum incurvato, squamis inferne concrescentibus, sine bulbilli, pedicellis

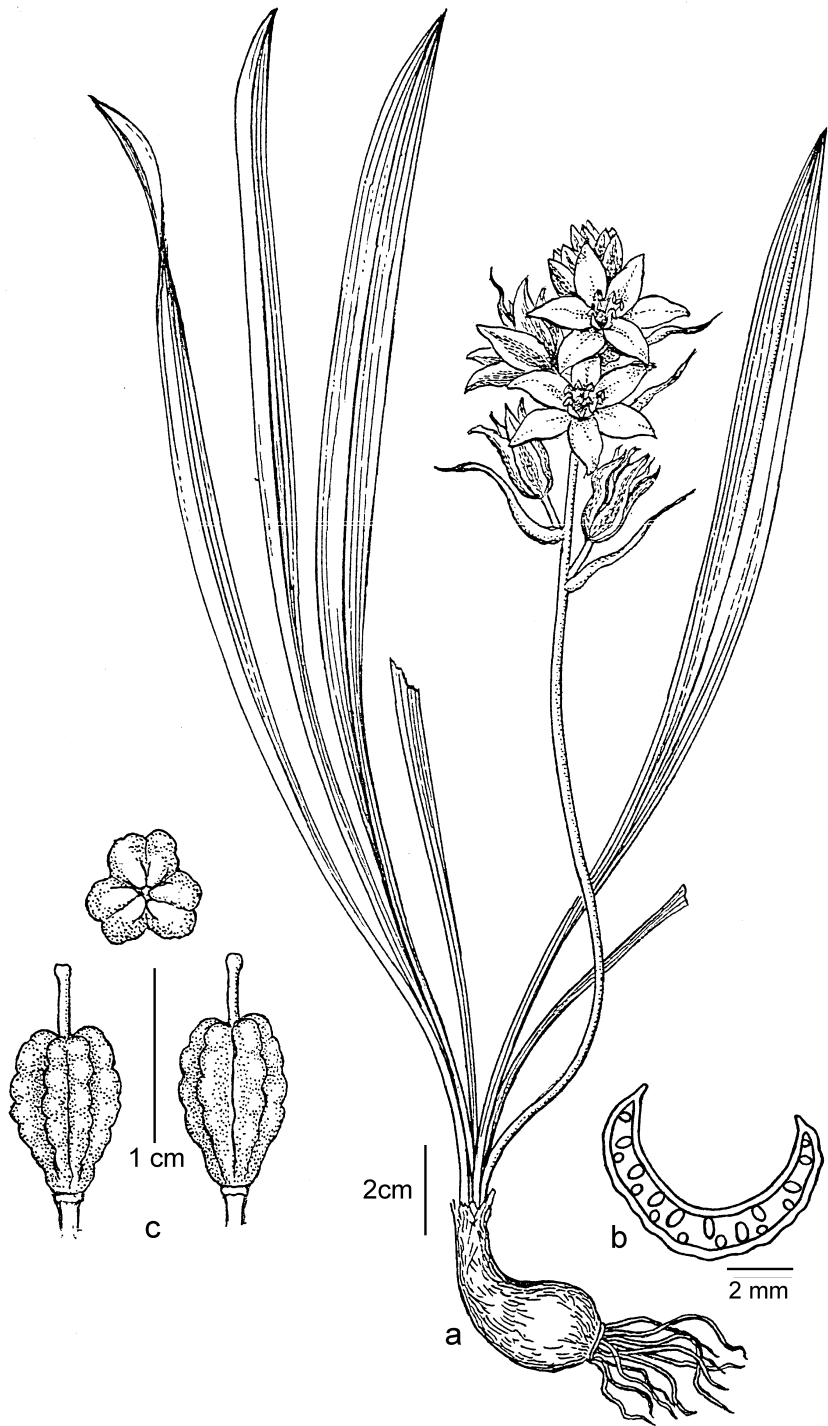


Fig. 1. *Ornithogalum gabrielianae* – a: flowering plant, b: leaf cross section, c: ovary . – Drawings after a plant from the population represented by the paratype Agapova, 1.6.1963.



Fig. 2. Flower of *Ornithogalum gabrielianae*. – Photograph by the author; plant of the population represented by the paratype Agapova, 1.6.1963; scale bar = 1 cm.

brevioribus (nec inferioribus sub anthesi abeunte ad 3 cm elongatis) bracteis brevioribus, ab *O. bungei* inflorescentia breviora laxiore pauciflora, pedunculis longioribus, tepalis latioribus (nec longe et tenuiter acuminatis), extus linea lata pallide viridi (nec longe acuminata viridi) notatis.

Bulbus forma peculiare saepe collo incurvato 1.5–1.7(2) cm alto praeditus, c. 1 cm in diam., squamis exterioribus pallidis, squamis 2(5) tunicatis inferne con crescentibus (siquantitas squamarum quinque est squamae externae liberae sunt), sine bulbillis. Folia plerumque 3–5(6), ad 40 cm longa, (3)9(15) mm lata, plana vel concava, tenera, viridia, concoloria, inferne angustata, apicem versus dilatata, apice obtuse acuminata, scapum interdum ad 10 cm superans. Scapus 12–26(28) cm, tener. Inflorescentia racemus abbreviatus 3–6(8) cm longus, c. 2.5–3 cm latus, 2–6(raro 9)-florus. Pedicelli breves, 8–9 mm longi, bracteis ad 2.5 cm longis breviores. Flores magni, c. 4 cm in diam. Tepala 1.8–2.6 cm longa, 4–6 mm lata, lanceolata, intus lactea, extus medio linea pallide viridi lata ad 2.5 mm ad apicem sensim angustiore (tepala interiora linea angustiore) notata. Filamenta 5–6 mm longa, a basi 2–2.5 lata sursum sensim acuminata, stylo subbreviora. Ovarium magnum, apterum, binatim approximatis, tuberculato-undulatis, obtusi-uscus praeditum. Stylus firmus c. 4 mm longus, ovario brevior. Semina (immatura) orbiculari-ovoidea, facie minute tuberculata. Maturatus fructus ignotus. Florendi tempus majus-junius. Chromosomatum numerus:  $2n = 58$ .

Haec species dedicatur Eleonora Gabrielian collectori et investigatori florum Armeniae.

Bulb 1.5–1.7(2) × c. 1 cm with pale external scales and often with curved collum, consisting of 2–5 tunicate scales con crescent in inferior part (in bulbs with 5 scales occasionally the two outer

Tab. 1. Diagnostic features of *Ornithogalum gabrielianae*, *O. bungei*, and *O. hyrcanum*.

Features	<i>O. hyrcanum</i>	<i>O. gabrielianae</i>	<i>O. bungei</i>
Bulb	ovoid	often with curved collum	?
Scales of bulb	tunicate, free	tunicate, partly conrescent	?
Offsets	2 bulbils	without bulbils	?
Scape length (without inflorescence)	(9)15(22) cm	6–9 (rarely 20) cm	(12)19–20(35) cm
Number of leaves	(2)3–4	(2)3–5 (rarely 6)	(3)5–6(8)
Leaves size [cm]	(11)24(33) × (0.2)0.6–1.2	22–40 × 0.3–0.9(1.5)	20–50 × (0.25)0.4–0.6(1)
Inflorescence length [cm]	(2.5)4(7)	3–6(8)	6–8(12)
Number of flowers	(2)4(8)	2–6 (rarely 9)	(4)6–10(20)
Lower pedicel length [mm]	13–16 to the end of anthesis up to 30	8–9	4–5(10)
Inflorescence at the end of anthesis	almost corymbose	laxly racemose	densely racemose
Lower bract length [mm]	(17)23(36)	25	23–25
Style length [mm]	4	4	4
Tepal size [mm]	20–26 × (4)5–6(9)	18–22(26) × 4–6	22–25 × (2.5)3–4
Tepal shape	ovate-lanceolate	lanceolate	linear-lanceolate

ones are free). Leaves usually (2)3–5, rarely 6, 22–40 × 0.3–0.9(1.5) cm, green and without a white stripe on adaxial face, flat or concave, tender, narrowed in lower part and broadened in upper part, obtusely acuminate, up to 10 cm longer than the scape. Scape 12–26(28) cm, tender. Inflorescence a raceme of 3–6(8) × 2.5(3) cm, with 2–6 (rarely 9) flowers; lower pedicels 8–9 mm, lower bracts 25 mm long. Flowers large, c. 4 cm in diameter, tepals 18–22(26) × 4–6 mm, lanceolate, white, ventrally with an up to 2.5 mm wide, pale green stripe only gradually narrowed upwards; stamens 5–6 × 2–2.5 mm; ovary large, with approximately paired, roundish-torulose, unwinged ribs; style strong, 4 mm long; (immature) seeds orbicular-ovoid, with minutely tuberculate surface. Mature fruit unknown.

Chromosome number: The species is polyploid with 2n = 58 (Agapova 1967 sub *O. hyrcanum*). A karyotype with one pair of short supernumeraries or semi-supernumeraries (2n = 58 + 2B?, Fig. 6) was found in a single plant of the population represented by the paratype *Gabrielian 100385*.

Distribution and ecology

*Ornithogalum gabrielianae* is a rather rare local endemic of the Armenian Aragatz mountain. Only three small populations have been discovered so far but, unfortunately, two of them have been destroyed in the course of road renovations since. The species is found on humus among rocks in the grassy mountain steppe with *Astragalus euoplus*, *A. aureus*, *A. microcephalus* and others, *Scrophularia ilvensis*, *S. olympica*, *S. orientalis*, *Daphne transcaucasica*, *Thymus kot-schyanus*, *Carduus adpressus* etc., and on heavy damp soil, associated with *Merendera raddeana*, *Puschkinia scilloides* and others.

Related species

*Ornithogalum gabrielianae* differs from *O. hyrcanum* particularly in the form and structure of the bulb (Fig. 5): the bulb of the latter species usually has two bulbils (versus lacking bulbils),



Fig. 3. Flower of *Ornithogalum bungei*. – Drawn from a slide taken by Per Wendelbo in the population represented by Wendelbo 342 (see specimens seen, below).

and consists of free (versus partially congruent) tunicate scales. In *O. hyrcanum*, in addition, the inflorescence is wider (Fig. 4), the pedicels are longer (Tab. 1), and the plants are stronger.

Another related and similar species is *Ornithogalum bungei* (Boissier 1884), which is common along the S Caspian Sea shores, occurring at rather high altitudes on open grassy slopes in the Hyrcanian type of forests. The new species differs from *O. bungei* by the lower number of leaves, the shorter, few-flowered inflorescence, longer pedicels, and wider tepals (see Tab. 1

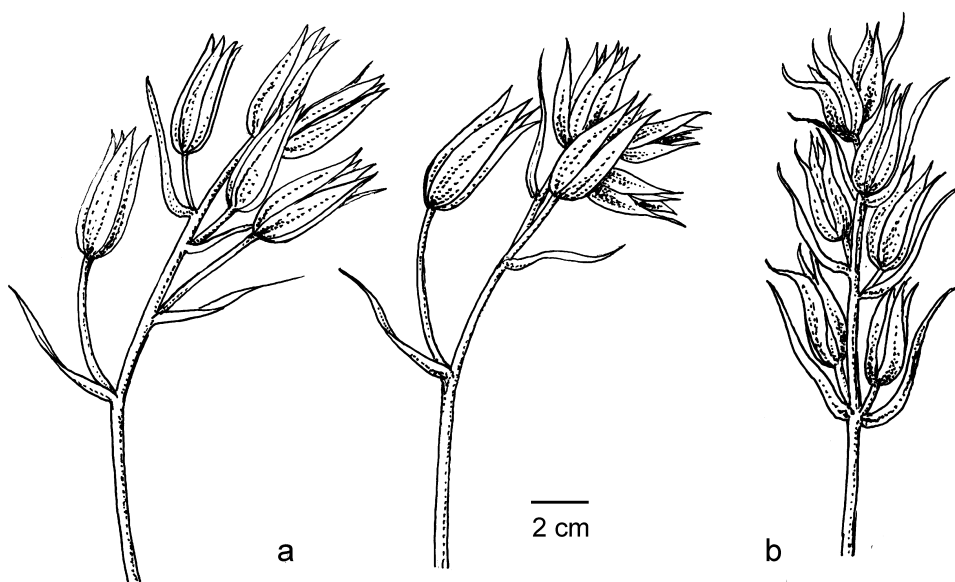


Fig. 4. Inflorescence at the end of anthesis – a: *Ornithogalum hyrcanum*, b: *O. gabrielianae*.

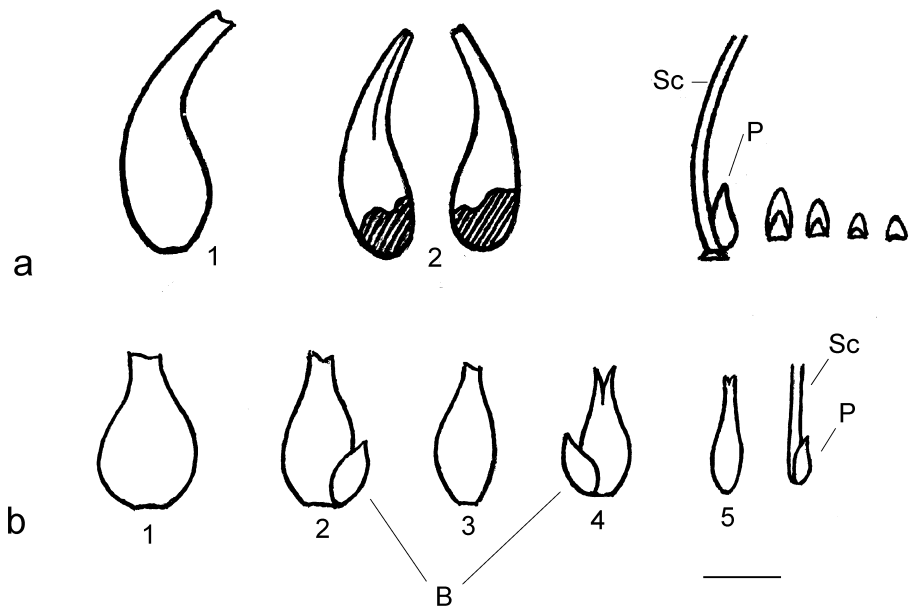


Fig. 5. The structure of the bulb – a: *Ornithogalum gabrielianae*, b: *O. hyrcanum*. – 1–5: Scales of bulb, Sc: scapus, P: renewal bud of the next year, B: bulbils; shaded area indicates the place of concrescence; scale bar = 1 cm.

and Figs 2–3); the tepals of *O. bungei* look still narrower due to their margins being slightly curved along the longitudinal axis. The pale green stripe on the abaxial tepal face is narrow and apically strongly attenuate in *O. bungei* but wide and little attenuate in *O. gabrielianae*.

Wendelbo (1985) and Rechinger (1990), in contrast, consider *O. hyrcanum* as a synonym of *O. bungei*. I do not find this view justified from the herbarium material studied. Unfortunately, no living plants were at my disposal for morphological and cytological investigations that could provide further evidence for the separation of the two species (the structure of bulbs of *O. hyrcanum* are based on fixed material).

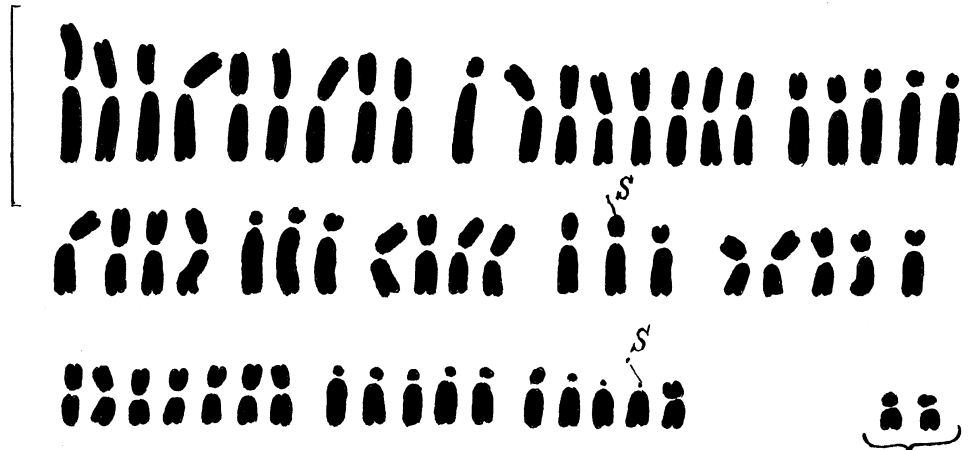


Fig. 6. *O. gabrielianae* – metaphase chromosomes ( $2n = 58 + 2$  supernumeraries). – Scale bar =  $10\mu\text{m}$ , s = satellite.

Following a suggestion by Brian Matthew, Kew, whom E. Gabrielian showed the plants from Aragatz, they were also compared with *O. luschanii* Stapf, of which, however, no material was found at Kew. This species has been described from the vicinity of the lake Van in Turkey (“In monte Nemrud Dag prope Kjachta, 1883, Luschan”, Stapf 1885: 79), and it occurs also in Iraq (Wendelbo 1985) and W Iran (Rechinger 1990). E. Gabrielian studied the lectotype in the Herbarium of Vienna University (WU) and provided me with photographs of and notes on the specimen. Based on these data, as well as Stapf (1885), Wendelbo (1985), and Rechinger (1990), *O. luschanii* differs from *O. gabrielianae* by its brown external bulb scales, a lower number of leaves (2–3), a few-flowered inflorescence, small flowers with 11–18(20) mm long tepals, and an obconical ovary with narrow and subundulate wings. Chromosome counts in *O. luschanii*, moreover, revealed numbers of  $2n = 28$ ,  $28+2B$ , and  $44$  (Johnson & al. 1991). Apparently, the species is not closely related to *O. gabrielianae*, *O. bungei* and *O. hyrcanum*, but possibly to *O. oligophyllum* Clarke.

#### The systematic position of *Ornithogalum gabrielianae*

*Ornithogalum hyrcanum* and *O. bungei* have been placed in different subdivisions of the genus by previous workers. Rechinger (1990) grouped *O. bungei* (including *O. hyrcanum*) in *O. subg. Beryllis*, apparently because he characterizes the species to have a cylindrical raceme with more than 15–20 flowers (“racemus cylindricus, floribus ultra 15–20”). Cullen & Ratter (1967), in contrast, place *O. hyrcanum* within *O. subg. Heliocharmos* Baker in their informal “montanum group” comprising *O. montanum* Cyr., *O. lanceolatum* Labill. and others. Zahariadi (1965, 1977), providing a new infrageneric classification of *Ornithogalum*, associates *O. hyrcanum* with *O. fimbriatum* Willd. in *O. subg. Hypogaeum* sect. *Fimbriatum* Zahar., which he separated from *O. subg. Heliocharmos* Baker (Zahariadi 1977).

Rechinger’s placement of *O. bungei* in *O. subg. Beryllis* mainly based on the number of flowers appears incorrect. *O. subg. Beryllis* actually differs from *O. subg. Ornithogalum* s.l. (= *O. subg. Heliocharmos* Baker) by a number of characters such as the age of the bulb (3–4 generations), the morphology of the inflorescence in bud (spikelike with several small imbricate bracts each covering a flower bud in *O. subg. Beryllis* versus similar to one large bud covered by 1–2 lower bracts, see Agapova 1977), the many-flowered raceme, and the tricostate ovary and capsule. Although further confirmation on living material would be desirable, it can be concluded from the available data that *O. gabrielianae* and its allies *O. hyrcanum* and *O. bungei* belong to *O. subg. Ornithogalum* s.l.

As far as their systematic position within *O. subg. Ornithogalum* s.l. is concerned, I do not, however, agree with Cullen & Ratter (1967) and Zahariadi (1977). In my opinion, *O. gabrielianae*, *O. hyrcanum*, and *O. bungei* should be considered as a separate group, differing from both the *O. montanum* and *O. fimbriatum* alliance. However, it would be necessary to have more information in order to establish a formal taxonomic entity comprising this group of species.

#### Specimens seen

##### *O. hyrcanum* Grossh.

AZERBAIJAN: Talysh, in sylvis. Barnassar in Zuvant, 1.6.1880 [fl./fr.] , *Radde* 665 (LE); prope p. Lerik, 5.1880 [fl.], *Radde* 414 (LE); prope p. Lerik, in sylva, 4.1915 [fl.], A. *Grossheim* (LE [holotype]); Lerik, in Orant-chai gorge, 21.4.1915 [fl.], A. *Grossheim* (LE); Lerik region between Orant and Shinabad villages, in the forest, 13.5.1946 [fl.], A. *Grossheim* (LE); Lerik region, 3 km from Orant on the way to Lerik, north slope, 13.5.1946 [fl.], M. I. Kirpichnikov & I. A. Iljinskaya (LE); Yardymly district, outskirts of vill. Dagh-Uzu, m. Uzun-Baschi, 2200 m, 21.5.1980 [fl.], T. *Popova* & J. *Menitsky* 305 (LE).

##### *O. bungei* Boiss.

IRAN: Prope Siaret et supra Asterabad, *Bunge* (LE [isotype]); Mazanderan, Haraz valley, west of Emarat, in dense deciduous forest,  $36^{\circ}15'N$ ,  $52^{\circ}18'E$ , c. 1600 m, 24.4.1959, *Per Wendelbo* 342 (LE).



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