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Ornithogalum montanum (Asparagaceae), a new alien species for the flora of Czechia

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HRONEŠ M. 2025: *Ornithogalum montanum* (Asparagaceae), a new alien species for the flora of Czechia. *Acta Musei Moraviae, Scientie biologicae* **110(1–2):** 1–9. – A new alien species, *Ornithogalum montanum* Cirillo, is reported here as naturalised in several localities in the wider vicinity of the Ostrava city, northern Moravia/Silesia. It represents the ninth species of the genus *Ornithogalum* occurring in Czechia. It belongs to *Ornithogalum* subgen. *Ornithogalum* and differs from other members of the subgenus occurring in Czechia by its wide, shiny, mid-green leaves without white or silver stripe, and by long, arcuately reaching branches of inflorescence. The chromosome number of naturalised plants is established as 2n=16.

Keywords. Asparagaceae, Hyacinthaceae, geophyte, neophyte, northern Moravia, Silesia, *Ornithogalum* subgen. *Ornithogalum*

Introduction

Genus *Ornithogalum* L. comprises monocot geophytes with distinct flowers formed by six tepals which are usually pure white adaxially and with green to yellow median stripe abaxially (ZAHARIADI 1980). The generic delimitation and intrageneric taxonomy are still in turmoil (MANNING *et al.* 2009, MARTÍNEZ-AZORÍN *et al.* 2011, see also HRONEŠ & UVÍROVÁ *in press* for review of the taxonomic concepts). The taxonomy of the genus is further hampered by high rates of polyploidy, low number of taxonomically useful morphological traits and their high homoplasy, and the fact that many morphological traits are difficult to assess on herbarium specimens (MORET & GALLAND 1992, MARTÍNEZ-AZORÍN *et al.* 2010). Thus, even in floristically well explored areas such as Central Europe, the number of occurring *Ornithogalum* species and their taxonomy is still unclear. This is evident for example by our recent discoveries of *O. divergens* Boreau thought to be extinct in Czechia (HRONEŠ *et al.* 2019) and *O. refractum* Kit. ex Willd. as a new species for flora of Slovakia (HRONEŠ & UVÍROVÁ *in press*).

Several species of *Ornithogalum* s. lat. are expected to be non-native to eastern part of Central Europe (i.e. Czechia, Poland, Austria, Slovakia and Hungary). *Ornithogalum divergens* is assessed as archaeophyte/neophyte in Czechia (PYŠEK *et al.* 2022). *Ornithogalum nutans* L. is considered an archaeophyte/neophyte or neophyte in Czechia and Slovakia (MEDVECKÁ *et al.* 2012, PYŠEK *et al.* 2022). *Ornithogalum boucheanum* (Kunth) Asch. is treated as naturalised in Poland and some parts of Czechia (HROUDA 2010, MIREK *et al.* 2020). Furthermore, two species occurring in southern Europe are reported as neophytes or casual aliens: *O. oligophyllum* E. D. Clarke from Austria (ROŽÁNEK 2020, GLASER *et al.* 2025) and *O. montanum* Cirillo from Poland (MIREK *et al.*

2020). Here, I report the occurrence of *O. montanum* as alien species also in Czechia where it grows in several localities in the wider agglomeration of Ostrava city. The species was first identified in the *Ornithogalum* material from Ústřední hřbitov cemetery in Slezská Ostrava provided by David Hlisnikovský in 2023 where one leaf and one inflorescence of *O. montanum* was mixed with *O. umbellatum* agg. The subsequent research showed that *O. montanum* is more widespread in wider Ostrava region.

Material and methods

Plant material was collected by author in April 2025 in two localities in Ostrava (northern Moravia/Silesia). Additional localities were found on the iNaturalist website (iNaturalist 2025). Observations of the obviously cultivated plants were excluded. Several plants were processed as herbarium specimens and deposited in the herbarium of the Department of Botany, Palacký University in Olomouc (OL, Thiers 2025). Some individuals were also transferred into the departments' greenhouse for further analyses.

The localities are sorted according to their affiliation to the phytogeographical districts (i.e. phytochorions sensu Skalický 1988), within phytochorions they are sorted according to the quadrants of the Central European grid mapping (Ehrendorfer & Hamann 1965). A map was prepared in QGIS 3.12 (https://qgis.org/).

Morphological characters for the description of the species were scored on living plants using digital calliper. General morphological terminology follows Beentje (2016).

Chromosomes were counted for the plant from Slezská Ostrava, Ústřední hřbitov cemetery (49°49′55.9″N 18°18′44.1″E). Actively growing root tips from plants cultivated in greenhouse were pre-treated in 8-hydroxyquinoline for six hours in the dark and at room temperature. Then they were fixed in solution of 96% ethanol : cold acetic acid (3:1) overnight. Maceration was done for four minutes in a solution of 35% hydrochloric acid : 96% ethanol (1:1). Macerated root tips were then placed into a small vial with Fe-acetocarmine and left for five minutes to stain. Then the meristem was gently dissected from the rest of the root tip, and squashes were made in a drop of Fe-acetocarmine. Resulting metaphases were observed under a Carl Zeiss, Axio Scope.A1 light microscope equipped with Axiocam 105 Color camera (both Carl Zeiss AG, Jena, Germany).

Results

Ornithogalum montanum was found in two localities in Slezská Ostrava (Ostrava city). Additional three records from iNaturalist website were considered, the search for *O. montanum* in one of them (Martinov) was unsuccessful in 2025 and in the two remaining observations it is unclear if the plants are cultivated or not. All the reported localities except the one in Darkovičky village (Opava district) occur in the wider vicinity of Ostrava city (Fig. 1). It should be treated as casual neophyte (sensu Pyšek *et al.* 2022).

Fig. 1. Distribution of known populations of *Ornithogalum montanum* in Czechia. Two localities with confirmed naturalised populations are marked by circle. Additional localities from iNaturalist website are displayed by triangles.

List of known localities of *O. montanum* in Czechia

74b. Opavská pahorkatina

6075cda Hlučín town (distr. Opava), Darkovičky village, lawns in Jandova street, 49°55′27.6″N 18°12′30.4″E, 255 m a.s.l., unclear if cultivated or not, 27 May 2024, not. A. Wognerová (https://www.inaturalist.org/observations/210077128).

83. Ostravská pánev

6174dbb Ostrava city (distr. Ostrava-město), Poruba, Osmý obvod, remnant of flower bed in Ludvíka Podeště street, 49°50′50.7″N 18°9′28.6″E, 271 m a.s.l., unclear if cultivated or not, 26 April 2024, not. Anonymus (https://www.inaturalist.org/observations/210010038)

6175acc Ostrava city (distr. Ostrava-město), Martinov village, Padělky, ruderal acidophilous oak forest with naturalised ornamental plants from garden heap north of the Mlýnek garden colony, 49°51′7.6″N 18°10′10.9″E, 238 m a.s.l., 11 May 2023, not. J. Hrdý (https://www.inaturalist.org/observations/161076134), probably casual occurrence, not found in 2025.

6175dba Ostrava city (distr. Ostrava-město), Slezská Ostrava, Slezská Ostrava-Kamenec, Dědičná street, ruderal lawn with naturalised geophytes (*Scilla luciliae* agg., *Tulipa* sp.), 49°50′45.7″N 18°17′45.9″E, 214 m a.s.l., probably naturalised, 25 April 2025, not. Anonymus (https://www.inaturalist.org/observations/272919432); 28 April 2025, not. M. Dokoupil (https://www.inaturalist.org/observations/275541187); 28 April 2025, not. E. Ramíková (https://www.inaturalist.org/observations/275578963); 3 May 2025, leg. M. Hroneš, OL.

6175dbc Ostrava city (distr. Ostrava-město), Slezská Ostrava, Ústřední hřbitov cemetery, lawns, 49°49′55.9″N 18°18′44.1″E, 272 m a.s.l., naturalised, locally spreading, 3 May 2025, leg. M. Hroneš, OL.

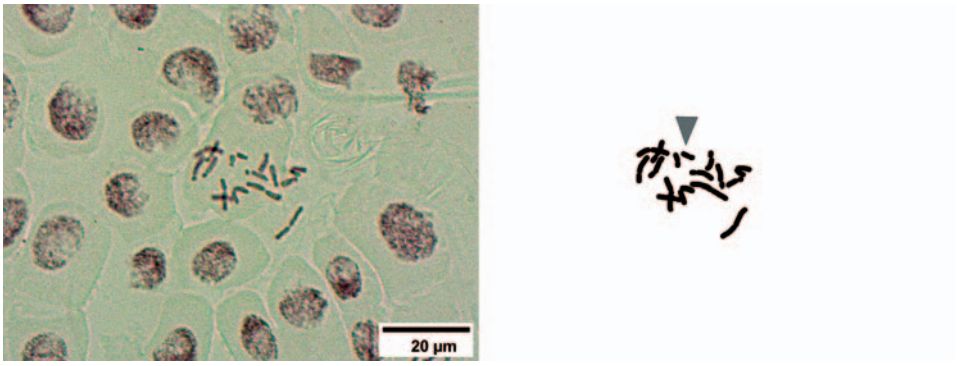

Fig. 2. Chromosomes of *Ornithogalum montanum* from Slezská Ostrava showing 2n=16. Grey triangle showing the smallest pair of chromosomes.

Karyology

The chromosome number of one individual from Slezská Ostrava cemetery resulted in 2n=16 (Fig. 2). The karyotype is asymmetric with one chromosome pair distinctly smaller than the rest.

Discussion

Ornithogalum montanum is a morphologically distinct species of European *Ornithogalum* s. str. distributed mostly in eastern Mediterranean from Italy to Caucasus and Levant (Raab-Straube 2022) with centre of its distribution in Balkan Peninsula (Landström 1989, Rat 2019). It differs from most of other European *Ornithogalum* s.lat. species by the combination of racemose inflorescence, long ascending pedicels and flat, wide, green and glabrous leaves without the median white stripe (Zahariadi 1980). Several narrowly endemic species have been lumped from *O. montanum*, e.g. *O. chionophilum* Holmboe from Cyprus, *O. pumilum* Zahar. from Crete, *O. christiniae* Kypriot., Tzanoud. & E. Antal. from a small islet near the western shore of Crete, *O. mysum* Speta and *O. sumbulianum* O. D. Düşen & I. G. Deniz both from western Anatolia (Zahariadi *et al.* 1982, Speta 1991, Düşen & Deniz 2005, Kypriotakis *et al.* 2025).

In its current circumscription, *O. montanum* s. str. is still karyologically quite variable species. Several cytotypes have been reported, including 2n=12, 14, 16, 18 and 20 (Lungeanu 1972, Markova *et al.* 1972, van Loon & Oudemans 1982, Landström 1989, Rat 2019). According to Landström (1989), the most widespread cytotype is 2n=18, which can be found throughout the range of the species from Sicily to the Caucasus Mts. and Lebanon. Cytotype 2n=16, found in plants from Ostrava, has been reported so far only from the Balkan peninsula (Serbia, Northern Macedonia and Greece; van Loon & Oudemans 1982, Rat 2019). Therefore, the origin of the populations from

Ostrava region reported here can be tentatively traced to the northern parts of the Balkan peninsula.

The species is distinct among *Ornithogalum* s. lat. species occurring in Central Europe, both native and introduced. Its flat wide leaves without the silvery adaxial stripe differentiate it well from the rest of the species. The only two species with similar leaves are *Ornithogalum* (*Loncomelos*) *sphaerocarpum* A. Kern. and *O. oligophyllum*. However, *O. sphaerocarpum* is much taller with many-flowered racemose inflorescence, growing mostly in semi-natural vegetation such as submontane mesophilous meadows (Hrouda 2010). Therefore, the only morphologically highly similar species in Central Europe is rarely naturalised *O. oligophyllum* (Zahariadi 1980, Rožánek 2020). *Ornithogalum montanum* differs from *O. oligophyllum* by higher number of leaves that are wider and flatter, and by flowers that are borne on long arcuate pedicels (Zahariadi 1980).

Temporal escape of *O. montanum* from cultivation is reported from southern Poland (Urbisz 2011, Mirek *et al.* 2020). However, the exact locality is not given. There is a specimen of *O. montanum* from Strzelniki village (distr. Brzeg, southern Poland) collected by J. Mądalski 1956 deposited in KRAM(!) herbarium (herbarium of the W. Szafer Institute of Botany, Polish Academy of Sciences). However, this specimen is annotated as cultivated or as a remnant of cultivation ("sadzona w starym ogródku"). The occurrences of *O. montanum* in Ostrava city and its wider vicinity here reported have probably a similar origin. The cultivation remnant or an escape from cultivation with garden heaps or by gradual self-seeding from flower beds is probable for all observed populations. What is more speculative, is how the species occurred in Ostrava city and why it escaped there and not anywhere else in Czechia. *Ornithogalum montanum* is only very rarely cultivated as ornamental in Czechia, mostly confined only to rock gardens specialising in bulbous plants (and even then, not very popular, *author personal observation*). The possible explanation can be that the species was brought to the Ostrava region as an ornamental plant by the Greek diaspora which was relocated to former Czechoslovakia in the 1950's and is quite numerous in Silesia and northern Moravia (Botu & Konečný 2005). The species then gradually became more common in cultivation in this region and naturalised in several places. This hypothesis can be supported by the presence of the 2n=16 cytotype found so far only in the Balkan peninsula. However, a proper resolution to this question will require much broader sampling and employment of molecular methods.

Description of *Ornithogalum montanum* based on plants collected in Ostrava city

***Ornithogalum montanum* Cirillo**, Fl. Napol. 1: XXII (1811). Fig. 3.

Bulbous, glabrous geophyte, 8.0–31.8 cm tall (from base of bulb to uppermost flower). Mature bulb single, 1.4–1.9 cm long, 1.2–1.6 cm in diameter, ovoid, bulb scales free, outer tunic light to dark brown, without bulbils or with 1–2 long pyriform bulbils. Leaves 3–5, 0.4–0.7 cm wide, slightly longer than scape and inflorescence together, wide linear,

flat to slightly canaliculate, apex distinctly cucullate, obtuse to acute, shiny mid-green, adaxially without silver stripe. Scape well-developed, for the most part aboveground, 3.0–14.2 cm long, basally white, apically light green. Inflorescence distinctly aboveground, widely corymbose, with 2–9 flowers; two lowest branches of the inflorescence 5.6–10.8 cm long, arcuate; bracts 1.1–2.7 cm long, much shorter than respective branch, long triangular, membranaceous, whitish brown. Flowers with 6 tepals in two whorls, adaxially white, abaxially white with green central stripe. Outer tepals 1.4–1.8 cm long, ca. 0.4 cm wide, with abaxial green stripe 0.3–0.4 cm wide, covering about 75–90 % of tepal width, reaching apex of tepal; inner tepals 1.2–1.6 cm long, 0.4–0.5 cm wide, with abaxial green stripe ca. 0.2 cm wide, covering about 50 % of tepal width, not reaching apex of the tepal. Filaments 4.6–6.0 mm long and ca. 1.4 mm wide at base, triangular, white. Anthers 1.6–1.8 mm long. Ovary 3.0–4.8 mm long and ca. 2.0 mm wide, cylindrical, with six well-spaced, obtuse ribs; style ca. 2.0 mm long. Fruiting pedicels elongating to 6.3–7.2 cm after anthesis, long arcuate, without basal pulvinus. Capsules not seen.

Distribution. Overall range covers central and eastern parts of the Mediterranean from Sicily to the Caucasus Mts, Lebanon and Israel and reaching as much north as to northern Bulgaria, central Serbia, Bosnia and Herzegovina, and Croatia (Zahariadi 1980, Rat 2019, Raab-Straube 2022). Casual occurrence is reported from southern Poland (Mirek *et al.* 2020). In Czechia, known naturalised occurrences are concentrated to the wider vicinity of the Ostrava city in Silesia.

Habitat and phenology. In its natural range, *O. montanum* inhabits rocky pastures, screes and dry grasslands (Zahariadi 1980). Occurrences in Czechia vary based on the place where a garden heap is deposited. Its habitats include various regularly mown lawns, usually with presence of other non-native spring geophytes (e.g. *Scilla luciliae* agg., *Tulipa* sp. div. and *Narcissus* sp. div.) and ruderal acidophilous oak forests. It flowers in the first half of May.

Souhrn

Ornithogalum montanum (Asparagaceae), nový zavlečený druh v květeně Česka

Snědek horský (*Ornithogalum montanum*) představuje nový občasně zavlékaný neofyt květeny Česka. Nalezeno bylo několik jeho populací, všechny se vyskytují v širším okolí Ostravy, mezi Hlučínem a Slezskou Ostravou. Část populací pravděpodobně vytrvává na lokalitách delší dobu a rostliny se zde zřejmě lokálně dokážou šířit přesevem. U několika dalších lokalit, které byly nalezeny při revizi pozorování rodu *Ornithogalum* na webu iNaturalist, nelze s jistotou určit, zda se jedná opravdu o zplanění rostlin, nebo jen pozůstatek kultivace. Snědek horský patří mezi pravé snědky (podrod *Ornithogalum*), z nichž se v Česku vyskytují pouze zástupci okruhu *O. umbellatum*. Od těchto druhů se *O. montanum* dobře odlišuje širokými, lesklými listy bez středového bílého nebo stříbrného pruhu a nápadně dlouhými, obloukovitě vystoupavými květními stopkami. Druh je v Česku pěstován velmi vzácně, proto je jeho zplanění na více lokalitách

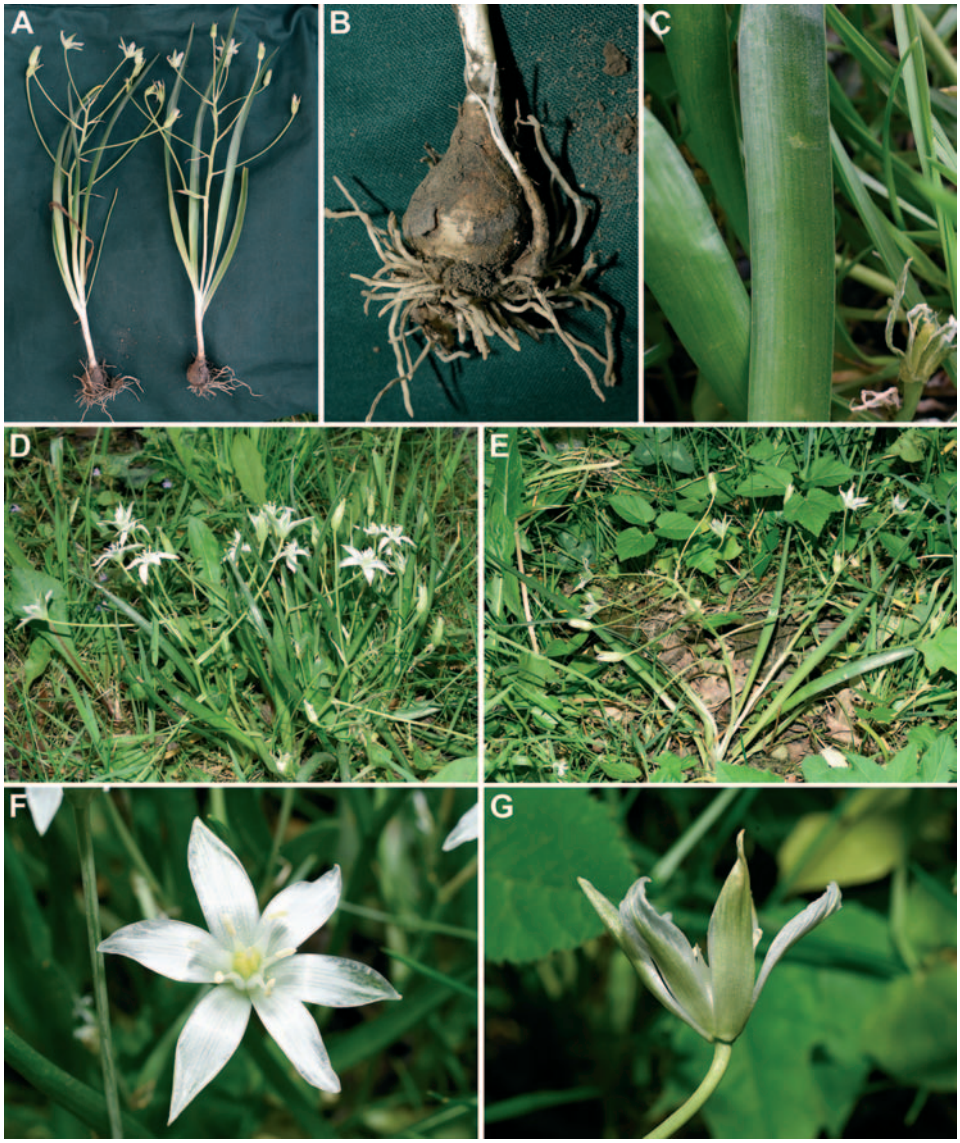

Fig. 3. Naturalised plants of *Ornithogalum montanum* Cirillo from Ostrava city. A – Habit of plants; B – Bulb with bulbil; C – Detail of leaf lamina; D – Clump of plants in situ; E – Post-anthetic plant with widely corymbose inflorescence/infructescence; F – Flower viewed from above; G – Side view of flower with distinct wide green stripe covering most of the tepal width. All photographs taken on 3 May 2025 in Slezská Ostrava, A–B, E population from Dědičná street, C, D, F, G population from Ústřední hřbitov cemetery.

poměrně překvapivé a je pravděpodobně důsledkem rozsáhlejšího pěstování právě na Ostravsku. U jedince z Centrálního hřbitova ve Slezské Ostravě byl metodou roztlakového preparátu zjištěn chromozomový počet 2n=16. Pro tento druh je z původního areálu uváděna celá řada cytotypů (2n=12, 14, 16, 18, 20). Počet 2n=16 je však uváděn pouze z relativně malého území, ze Srbska, Makedonie a Řecka. Lze tak hypotetizovat, že slezské populace mají původ právě v této oblasti. Na Ostravsko mohly být rostliny přivezeny zástupci početné řecké diaspory a lokálně se rozšířit v kultivaci.

Acknowledgements

My thanks belong to David Hlisnikovský who accidentally found *O. montanum* in Slezská Ostrava for the first time, and to Barbora Kovalová for discussion on the chromosome counts. Comments by Pavol Eliáš, Vojtěch Taraška and anonymous reviewers helped to improve the manuscript.

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