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GEOPHYTES IN HISTORIC CEMETERIES: BETWEEN CULTIVATION AND PERSISTENCE

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ABSTRACT

This paper presents the results of floristic investigation in five historical cemeteries from Bucharest: Șerban Vodă - Bellu Orthodox, Bellu Catholic, Evangelic Lutheran, Izvorul Nou, Annunciation Berceni. All are over 100 years old, the first three being established at the middle of XIXth century, while the last two were established at the end of XIXth century and, respectively, at the beginning of XX century. The investigation revealed that historical cemeteries provide suitable environments for the persistence and cultivation of a diverse range of geophytes, including native and alien ornamental taxa. A total of 58 geophytes were inventoried in these five cemeteries. Their current occurrence reflects a combination of planting practices, long-term persistence and occasional escape from cultivation. Park-cemeteries, with rich vegetation, are true reservoirs of biodiversity, sheltering rare and threatened plants species, protected at national level.

INTRODUCTION

Cemeteries are important components of the urban and peri-urban landscape and can constitute true reservoirs of plant biodiversity, sheltering numerous plant species, both intentionally cultivated and spontaneously installed (Galera et al. 1993, Nowińska et al. 2020). Their importance for plant diversity can be particularly evident in the case of historic cemeteries, where vegetation has developed and changed over long periods, reflecting both changes in management practices and the horticultural preferences of different generations. Here, remains of the original native flora may coexist with cultivated plants, including those planted either for their funerary symbolism or for personal associations, others that have become naturalized, and weeds (Mc Barron et al.1988, Barrett and Barrett 2002, Skobel et al. 2023, Skobel & Moysiyenko 2025).

Older cemeteries are often characterized by a cemetery-park type structure, in which mature trees, planted along alleys or around funerary plots, are an important element of the landscape (Bezviconi 1972**,** Leisner 2005). This structure contributes to the creation of a variety of ecological conditions and can favour the maintenance of a diverse flora. At the same time, at the grave level, the choice of plants is often

influenced by the need for low maintenance and their ability to withstand periods of drought or other adverse environmental conditions (Pozdnyakova & Murzatayeva 2024). In this context, perennials are an important component of cemetery vegetation, due to their ability to persist for several years in the same place.

These plants include geophytes, perennial herbaceous plants that survive adverse times through specialized underground organs, such as bulbs, rhizomes, tubers, or corms (Raunkier 1934). The nutrient reserves accumulated in these organs allow geophytes to overcome periods of drought, low temperatures, or other adverse conditions and resume growth when conditions become favourable. (Cristea et al. 2004, Khodorova & Boitel-Conti 2013). This life strategy, coupled with the possibility of low maintenance after installation, makes geophytes well adapted to spaces where maintenance interventions are limited or discontinuous, such as numerous cemeteries.

An important part of geophytes is represented by ornamental species, appreciated for the diversity of flowers and widely used in horticulture, contributing significantly to the global flower market (Nowińska et al. 2020, Benschop et al. 2010). Their ornamental value has led to numerous geophytes being cultivated and appreciated since historical periods, being mentioned in sources relating to the history and mythology of the ancient world (Bryan 1989, 2002). At the same time, the group of geophytes includes many rare, threatened or endangered species, which also gives them special importance from the perspective of biodiversity conservation (Anderson 2005).

In cemeteries, the presence of geophytes can have different origins. Some species are intentionally planted as ornamental plants on graves, while others may persist for a long time after cultivation has ceased or expand from the original planting site to surrounding spaces. Other species may arise spontaneously, with no obvious horticultural origin. Therefore, geophyte communities in cemeteries may reflect both current and historical horticultural practices and the ability of these plants to persist and spread over time (Yazici et al. 2016).

In this context, historic cemeteries can represent important spaces for the maintenance of some species of geophytes, including ornamental plants that have been cultivated in the past and continue to be present after long periods. The study of these species can contribute to a better understanding of the plant diversity of cemeteries and their role in maintaining plants that, in other urban spaces, may be less represented (Arslan et al. 2012).

The purpose of this work is to evaluate the diversity of geophytes in the investigated historical cemeteries and to identify the species that are maintained in these spaces, to highlight the influence of certain horticultural practices, historical and current, in transforming cemeteries into true biodiversity hot spots.

MATERIAL AND METHODS

Investigated area. The study was carried out in five historical cemeteries, over 100 years old: Șerban Vodă - Bellu Orthodox (1858), Șerban Vodă - Bellu Catholic (1863), Evangelical Lutheran (1859), Izvorul Nou (1895), Annunciation Berceni (1921) (Table 1). The five cemeteries are in the municipality of Bucharest, which have the following physical-geographical and climatic peculiarities: average altitude 85 m, temperate-continental climate, average annual temperature 11ºC, average annual rainfall 576.7 mm (Andrei 2024). The first three cemeteries are organized according to the cemetery-park concept, with many secular trees and rich

vegetation, while the Izvorul Nou and Annunciation Berceni cemeteries are dominated by the presence of monuments and funerary plaques, nature being contextually installed among the graves.

Field observations were carried out on the entire surface of each cemetery, over a period of three years (2023-2025), through monthly visits between March and September.

Dataset organization and data analysis. During each visit, the species of geophytes were identified and recorded. For each inventoried taxon, the following attributes were recorded and analysed: the botanical family (according to Plants of the World Online – POWO 2026), types of geophytes, the ornamental significance, the allochthonous and invasive status in Romania (Anastasiu et al. 2019), the threatened status [Oltean et al. (1994), Boșcaiu et al. (1994), Dihoru & Negrean (2009), Dihoru & Dihoru (1993-1994), IUCN Red List of Threatened Species (2026)] and their presence in the five analysed cemeteries.

Table 1

List of cemeteries investigated in Bucharest, specifying the year of establishment, the area and the religion

Nume	Year of establishment	Surface (ha)	Religion
Șerban Vodă - Bellu (Orthodox)	1858	22	Orthodox
Evanghelic Lutheran	1859	4,5	Luteran
Șerban Vodă - Bellu (Catholic)	1863	6	Catholic
Izvorul Nou	1895	8,65	Orthodox
Annunciation (Buna Vestire) Berceni	1921	1,7	Orthodox

RESULTS AND DISCUSSION

The inventory carried out in the five historical cemeteries in Bucharest revealed a total of 58 taxa of geophytes (Annex 1), a value that is higher compared to that recorded for the historical parks in Bucharest, of 45 taxa (Anastasiu et al. 2025). Of the 13 botanical families to which the inventoried geophytes belong, the best represented are Liliaceae, with 12 taxa, Amaryllidaceae and Asparagaceae, with 11 taxa each, respectively Iridaceae, with 8 taxa. Together, these four families totalled 42 taxa, representing 72.4 % of the total inventoried. The other families were represented by a much smaller number of taxa: Ranunculaceae and Oxalidaceae (3 each), Paeoniaceae, Polygonaceae and Papaveraceae (2 each), and Brassicaceae, Araceae, Primulaceae and Asphodelaceae by one taxon each. The taxonomic structure thus highlights the predominance of families characterized by an important component of ornamental geophytes (Christenhusz et al. 2017).

The analysis of the types of geophytes indicates a clear dominance of bulbous species. Of the 58 taxa inventoried, 36 (62.1 %) are bulbous geophytes, 16 (27.6 %) have rhizomes, and 6 (10.3 %) have tubers.

Most bulbous plants are consistent with both the high diversity of the Amaryllidaceae and Liliaceae families, as well as the long use of numerous bulbous plants as ornamentals. Tulips, daffodils, hyacinths, lilies, snowdrops and other bulbous geophytes are plants traditionally associated with ornamental horticulture

and can persist in the same location for long periods, including after the reduction or cessation of maintenance work.

The rhizome geophytes were mainly represented by taxa belonging to the genera *Iris*, *Paeonia* and *Hosta*, while the tuber category included, among others, representatives of the genera *Corydalis* and *Anemone*, as well as *Arum orientale*. This characteristic can be especially important in cemeteries, where soil surface conditions can change over time through mowing, removal of vegetation, work around graves, drought or periods when maintenance is low. Underground organs allow plants to persist even when the aerial part is temporarily removed.

The analysis of the geophyte inventory shows the very high share of taxa used as ornamental plants. Of the total of 58 taxa identified, 51 (87.9 %) have ornamental use, which highlights the predominant horticultural character of the geophyte component in the investigated cemeteries. The geophytes inventoried without ornamental use are *Allium ursinum*, *Arum orientale*, *Gagea pratensis*, *Gagea minima*, *Gagea villosa*, *Oxalis corniculata* and *Oxalis stricta*. The top five are spontaneous species also found in the forests around Bucharest, while *Oxalis corniculata* and *Oxalis stricta* are alien species, included in the list of invasive and potentially invasive alien species in Romania (Anastasiu et al. 2019).

The presence of many ornamental plants reflects the role of cemeteries as spaces where vegetation is associated not only with ecological function, but also with cultural and aesthetic practices. Planting flowers on graves is one of the ways in which plants are integrated into funeral rituals and the care of memorial spaces, and geophytes occupy an important place due to their ornamental diversity, different flowering periods and the ability of many of them to persist for several years in the same location.

The choice of geophytes can also be linked to the symbolism attributed to flowers in different cultures. The lily (*Lilium* spp.), for example, is associated with purity, innocence, and the liberation of the soul from worldly burdens, thus being frequently linked to funerary representations. In some traditions, the presence of the lily on the grave is also associated with the protection of the funerary space (Mitchell 2026). The iris (*Iris* spp.), whose name comes from the Greek "iris", meaning rainbow, is linked in Greek mythology to the messenger of the gods and the connection between heaven and earth (Mitchell 2026). Such meanings contribute to the integration of plants into memory and funerary practices, with flowers becoming not only decorative elements, but also bearers of symbols associated with life, death, commemoration, and transition (Mitchell 2026).

From the perspective of geographical origin, the inventory includes 29 autochthonous taxa and 29 allochthonous taxa for the flora of Romania. This structure highlights the mixed character of the geophyte flora in the historical cemeteries, in which native plants, spontaneous or cultivated, coexist with the non-native ones, whether cultivated, escaped from cultivation, naturalized or invasive.

Of the native taxa, an important part is represented by species that are associated with forest habitats or border vegetation. In cemeteries, these species have been observed not only near graves, but also on alleys, in less maintained areas and in areas where spontaneous vegetation can develop. Relevant examples are represented by *Anemone* spp., *Corydalis* spp., *Gagea* spp., *Galanthus nivalis*, *Ornithogalum* spp. and *Scilla bifolia* s.l. Their presence on large areas of cemeteries suggests that these spaces can function as urban refuges for certain elements of

spontaneous flora, especially when there is temporal continuity of vegetation and areas that are not subject to intensive maintenance.

A distinct situation is represented by the native taxa also used as ornamental plants (Annex 1). We mention here the species of crocuses (*Crocus flavus*, *Crocus chrysanthus*), dwarf iris (*Iris pumila*), butcher's broom (*Ruscus aculeatus*), snowdrop species (*Galanthus plicatus*, *Galanthus elwesii*). They demonstrate that the delimitation between the spontaneous flora and the horticultural component is not always strict. Some native species may be deliberately introduced into gardens and graves and may subsequently persist or expand outside planted areas.

The analysis of the 29 allochthonous taxa highlights that the most numerous categories is represented by cultivated taxa, with 20 taxa. These are maintained mainly as ornamental plants and represent the most direct expression of horticultural activity in cemeteries. These include *Allium neapolitanum*, *Allium nigrum*, *Cyclamen persicum*, *Fritillaria imperialis*, *Hosta plantaginea*, *Hyacinthus orientalis*, *Ipheion uniflorum*, *Iris hollandica*, *Lilium* × *hybridum*, *Lilium* regale, *Oxalis articulata*, *Tulipa Clusiana* and *Tulipa greigii*. The second category is represented by taxa that have been dropped from culture, such as *Hemerocallis fulva*, *Tulipa agenensis* and *Tulipa gesneriana* (Annex 1). They can occur outside the areas where they were planted, but without forming stable populations, their presence being based on repeated introductions. The third category includes four invasive taxa, namely *Oxalis corniculata*, *Oxalis stricta*, *Reynoutria bohemica* and *Reynoutria japonica*.

This differentiation is important because cemeteries can simultaneously represent spaces for the deliberate introduction of ornamental plants and spaces where certain alien species can exceed the limits of cultivation, naturalizing or even becoming invasive. Recent studies on the flora of cemeteries also emphasize the role of these spaces in maintaining a complex urban flora, in which native species overlap with alien species, whether naturalized or invasive (Rutkovska, 2011).

The analysis of the conservation status highlights the presence in cemeteries of several taxa of conservation interest: according to the IUCN status (2026), 14 taxa are classified as Least Concern (LC) and two as Near Threatened (NT). Among them are *Galanthus nivalis* (NT), as well as *Galanthus plicatus* (LC), *Paeonia peregrina* (LC), *Ruscus aculeatus* (LC) and *Leucojum aestivum* (LC), native taxa of the flora of Romania, along with ornamentally cultivated alien species, such as *Tulipa agenensis* (LC) and *Tulipa greigii* (LC).

At national level, eight taxa have at least one classification in one of the reference lists used: *Crocus chrysanthus*, *Crocus flavus*, *Galanthus elwesii*, *Galanthus plicatus*, *Leucojum aestivum*, *Muscari neglectum*, *Paeonia peregrina* and *Ruscus aculeatus* (Annex 1).

Thus, cemeteries can be seen as spaces of intersection between the conservation of biological heritage and the preservation of cultural heritage. Recent research shows that cemeteries can contribute significantly to the diversity of urban flora, and the type of landscaping, site history, connectivity and diversity of microhabitats can influence floristic composition (Löki et al. 2019).

Regarding the distribution of geophytes in the five cemeteries, the number of taxa differs considerably between the five cemeteries investigated. The greatest diversity was recorded in the Bellu Orthodox Cemetery, with 38 taxa, followed by the Bellu Catholic Cemetery, with 34, and the Evangelical Cemetery, with 32. In the Izvorul Nou Cemetery, 21 taxa were identified, and in the Annunciation Berceni Cemetery 13 taxa. The richness in geophytes is thus higher in park-type cemeteries,

with rich vegetation, and lower in the cemeteries of the late nineteenth and early twentieth centuries, with contextual vegetation, among the graves.

The analysis of the frequency of occurrence of taxa in the five investigated cemeteries highlights a high degree of differentiation between sites. Of the total of 58 taxa, 7 (12.1 %) were identified in all five cemeteries, 5 (8.6 %) in four cemeteries, 13 (22.4 %) in three cemeteries, 11 (19.0 %) in two cemeteries, and 22 (37.9 %) were identified in a single cemetery. This distribution indicates that, although there is a nucleus of common species, a considerable proportion of the geophyte flora is associated with individual sites.

The seven taxa identified in all five cemeteries are *Anemone ranunculoides*, *Convallaria majalis*, *Hyacinthus orientalis*, *Iris* × *germanica*, *Narcissus pseudonarcissus*, *Oxalis corniculata* and *Tulipa gesneriana*. The characteristics of this group are relevant for the interpretation of the distribution. On the one hand, *Anemone ranunculoides* and *Convallaria majalis* are native taxa that can occur spontaneously in habitats with favourable conditions, while *Hyacinthus orientalis*, *Iris* × *germanica*, *Narcissus pseudonarcissus* and *Tulipa gesneriana* are ornamental plants widely used in horticulture. The presence of the latter in all five sites can be associated with the use of traditional ornamental plants in the arrangement of tombs. A study of cemeteries in Timisoara also highlighted the frequent use of genera such as *Tulip*, *Narcissus*, *Iris* and *Paeonia* in funerary spaces (Otves et al. 2016).

The wide distribution of some ornamental species can also be explained by their availability in horticulture and by the biological characteristics that favour their persistence. Genera such as *Tulip*, *Narcissus*, *Crocus*, *Hyacinthus*, *Iris*, *Hemerocallis* and *Hosta* are used in Romania as ornamental plants, including in landscaping. In addition, the existence of reserve underground organs and the capacity for vegetative regeneration allow many such plants to persist for a long time after planting, reducing their dependence on annual horticultural interventions.

As for taxa with restricted distribution, the 22 species identified in a single cemetery can more clearly reflect the specifics of each cemetery, both ecologically and culturally. Of these, 20 are ornamental plants, i.e. more than 90 % of the category with point distribution. At the same time, nine of the cultivated allochthonous taxa appear in a single cemetery.

These data support the hypothesis that the punctual distribution of an important part of the geophytes can be associated with recent horticultural introductions or local planting preferences. Taxa such as *Oxalis articulata* and *Iris hollandica* are relevant in this regard, as they represent ornamental plants that have more recently entered the horticultural circuit used by the Romanian public. Their presence in a single cemetery may reflect the still localized character of their use.

All this data helps us to give a more nuanced interpretation of the frequency of geophytes: widely distributed taxa can reflect either a traditional and widespread ornamental use or a high capacity for persistence and spread, while taxa with point distribution can retain information about recent planting history and local horticultural preferences.

The Bellu Orthodox, Bellu Catholic and Evangelical cemeteries have a character of cemetery-park, with a more complex landscape structure and an important presence of arborescent vegetation, while the Annunciation Berceni and Izvorul Nou, established later than the other three, present a structure specific to neighbourhood cemeteries, more open, with a lower arborescent component and a higher proportion of graves directly exposed to the sun. These differences in

structure can determine a greater diversity of microhabitat conditions and influence the composition and distribution of geophytes, along with other factors such as the surface area of the cemetery, the age of the site, the intensity of maintenance and the history of plantations.

A relevant example is represented by the Bellu Orthodox Cemetery, whose actual arrangement began in 1855, and which was organized under the influence of European cemetery-park models, including the famous Père-Lachaise in Paris. Historical sources mention the organization on lots, the presence of decorative trees and some non-indigenous species, as well as the intention to give the whole the character of a "cemetery garden" (Bezviconi, 1972). The current character of the Bellu Orthodox Cemetery, with mature trees, well-developed woody vegetation and ornamental components accumulated over time, may contribute to the diversity of microhabitat conditions and, implicitly, to its high floristic diversity.

The Bellu Catholic Cemetery, established in 1863, presents, in turn, a landscape structure characterized by the presence of mature arborescent vegetation and ornamental components developed over time. Although the history and confessional affiliation differ from those of the Bellu Orthodox Cemetery, the current structure of the site allows it to be classified in the category of historical cemeteries with the character of cemetery-park (Bezviconi, 1972).

In the case of the Evangelical Cemetery, opened in 1897 on the land of the former Filantropia Cemetery, the well-developed plant structure and the presence of mature trees also contribute to the site's character as a cemetery-park (Bezviconi, 1972). The history and community belonging differ from those of the Bellu cemeteries, but all three are part of the broader evolution of Bucharest's funerary spaces in the nineteenth and twentieth centuries, in which the cemetery acquired, in addition to its funerary function, also valences of green space, memory and cultural representation.

This landscape structure is relevant for the interpretation of the floristic results, because the presence of mature trees, the diversity of vegetation and the existence of surfaces with different degrees of shading and disturbance can determine a greater diversity of microhabitats and can favour the persistence of some taxa over long periods. In this context, the character of cemetery-park may represent one of the factors contributing to the differences in floristic composition observed between the three cemeteries and sites with a more open structure, such as Izvorul Nou and Annuciation Berceni.

CONCLUSIONS

The study highlights a high diversity of geophytes in the historical cemeteries of Bucharest, compared to that recorded in the historical parks, with 58 taxa belonging to 13 families being identified, with a strong representation of the plants used ornamentally. The inventoried flora reflects the overlap between the spontaneous and horticultural components, both native species and allochthonous taxa being represented, most of the latter being cultivated.

The distribution of geophytes between cemeteries is uneven and reflects both the history of ornamental use and the persistence of cultivated plants, as well as the processes of spread and maintenance of spontaneous species. Widely distributed taxa may reflect the long and widespread use of ornamental plants, while point-distributed taxa may retain information about more recent horticultural introductions or local planting preferences.

The differences between cemeteries can be associated with their age, surface and landscape structure. Cemeteries with a cemetery-park character, such as Bellu Orthodox, Bellu Catholic and Evangelical, have a more complex vegetation structure, while Izvorul Nou and Annunciation Berceni have a more open structure, these differences being able to contribute to the diversity of microhabitat conditions and the distribution of geophytes.

The results support the consideration of historical cemeteries not only as funerary spaces, but as spaces of intersection between cultural heritage, horticultural history and urban biodiversity. The age of the sites and the ability of geophytes to persist through underground reserve organs allow the maintenance of plants introduced long ago, while less intensely maintained areas can favour the persistence and spread of spontaneous species.

At the same time, the floristic composition preserves information about successive horticultural practices. Widespread ornamental taxa may reflect plants used and accessible over several generations, while point-distributed taxa may represent imprints of more recent introductions or local preferences. From this perspective, the flora of geophytes can be considered a form of horticultural memory of cemeteries.

Overall, the diversity of geophytes observed in the investigated cemeteries is the result of the overlap between ecological processes and cultural practices: spontaneous flora, persistence of cultivated plants, recent horticultural introductions and, in some cases, the spread of non-native taxa together contribute to the current structure of vegetation. Historical cemeteries can thus constitute both important spaces for maintaining urban plant diversity and true living archives of the relationship between society and plants, simultaneously preserving elements of the local flora and traces of the horticultural history of the city.

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ANNEX 1

List of geophytes from historical cemeteries in Bucharest

Taxon	Annunciation Berceni	Izvorul Nou	Evangelic	Bellu Catholic	Bellu Orthodox	General status	Family	Ornamental	Geophyte type	IUCN Status (Global & Europe)	Dihoru & Negrean (2009) - Red Data Book	Oltean et al. (1994)	Dihoru & Dihoru (1994)	Boşcaiu, Coldea & Horeanu (1994)	Alien status in Romania
Allium neapolitanum Cirillo					c	c	Amaryllidaceae	1	B						Allochthonous
Allium nigrum L.			c			c	Amaryllidaceae	1	B	LC					Allochthonous
Allium rotundum L.				s	s	c	Amaryllidaceae	1	B						Autochthonous
Allium ursinum L.					s	s	Amaryllidaceae	0	B	LC					Autochthonous
Anemone blanda Schott & Kotschy					c/sb	sb	Ranunculaceae	1	T						Allochthonous
Anemone nemorosa L.				s		s	Ranunculaceae	1	R						Autochthonous
Anemone ranunculoides L.	s	s	s	s	s	s	Ranunculaceae	1	R	NA					Autochthonous
Arum orientale M.Bieb.		s			s	s	Araceae	0	T	NA					Autochthonous
Cardamine bulbifera (L.) Crantz				s	s	s	Brassicaceae	1	R						Autochthonous
Convallaria majalis L.	c/sb	c	s	c/sb	s	c/s	Asparagaceae	1	R	LC					Autochthonous
Corydalis cava (L.) Schweigg. & Körte		s	s	s		s	Papaveraceae	1	T						Autochthonous
Corydalis solida (L.) Clairv.		s	s	s	s	s	Papaveraceae	1	T	NA					Autochthonous
Crocus chrysanthus (Herb.) Herb.				c		c	Iridaceae	1	B		VU	VU	EN	R	Autochthonous
Crocus flavus Weston			c	c		c	Iridaceae	1	B			VU	VU	VU	Autochthonous

Crocus sieberi J. Gay			c			c	Iridaceae	1	B	LC					Allochthonous
Crocus vernus (L.) Hill			c	c	c	c	Iridaceae	1	B						Autochthonous
Cyclamen persicum Mill.				c		c	Primulaceae	1	T	LC					Allochthonous
Fritillaria imperialis L.					c	c	Liliaceae	1	B						Allochthonous
Gagea minima (L.) Ker Gawl.			s	s	s	s	Liliaceae	0	B	NA					Autochthonous
Gagea pratensis (Pers.) Dumort.			s			s	Liliaceae	0	B	NA					Autochthonous
Gagea villosa (M.Bieb.) Sweet		s	s	s	s	s	Liliaceae	0	B						Autochthonous
Galanthus elwesii Hook.f.		c	c		c	c	Amaryllidaceae	1	B	DD		VU	EN		Autochthonous
Galanthus nivalis L.			c/s	s	c/s	c/s	Amaryllidaceae	1	B	NT					Autochthonous
Galanthus plicatus M.Bieb.			c			c	Amaryllidaceae	1	B	LC	VU	VU	VU	R	Autochthonous
Hemerocallis fulva (L.) L.	c/sb	c		c/sb	c/sb	c/sb	Asphodelaceae	1	R						Allochthonous
Hosta plantaginea (Lam.) Asch.		c	c	c	c	c	Asparagaceae	1	R						Allochthonous
Hyacinthus orientalis L.	c	c	c	c	c/sb	c/sb	Asparagaceae	1	B						Allochthonous
Ipheion uniflorum (Graham) Raf.					c	c	Amaryllidaceae	1	B						Allochthonous
Iris × *germanica* L.	c	c	c	c	c	c	Iridaceae	1	R						Allochthonous
Iris × *hollandica* H.R.Wehrh.			c		c	c	Iridaceae	1	B						Allochthonous
Iris pumila L.		c				c	Iridaceae	1	R	LC					Autochthonous
Iris reticulata M. Bieb.		c	c		c	c	Iridaceae	1	R						Allochthonous
Leucojum aestivum L.					c	c	Amaryllidaceae	1	B	LC		VU	VU		Autochthonous
Lilium candidum L.		c		c	c	c	Liliaceae	1	B	NT					Allochthonous
Lilium sp. (hybrid)					c	c	Liliaceae	1	B						Allochthonous

Lilium regale E. H. Wilson				c		c	Liliaceae	1	B						Allochthonous
Muscari botryoides (L.) Mill.		c				c	Asparagaceae	1	B						Autochthonous
Muscari neglectum Guss. ex Ten. & Sangiov.			c	c	c/sb	c/sb	Asparagaceae	1	B	NA		VU			Autochthonous
Narcissus poeticus L. subsp. *poeticus*	c		c		c	c	Amaryllidaceae	1	B	LC					Allochthonous
Narcissus pseudonarcissus L.	c	c	c	c	c	c	Amaryllidaceae	1	B	NA					Allochthonous
Ornithogalum boucheanum (Kunth) Asch.			s	s	s	s	Asparagaceae	1	B	NA					Autochthonous
Ornithogalum pyramidale L.				s		s	Asparagaceae	1	B						Autochthonous
Ornithogalum umbellatum L.			s	s		s	Asparagaceae	1	B	NA					Autochthonous
Oxalis corniculata L.	s	s	s	s	s	s	Oxalidaceae	0	R	NA					Allochthonous
Oxalis stricta L.	s			s	s	s	Oxalidaceae	0	R	NA					Allochthonous
Oxalis articulata Savigny			c	c			Oxalidaceae	1	T						Allochthonous
Paeonia lactiflora Pall.	c	c	c	c		c	Paeoniaceae	1	R						Allochthonous
Paeonia peregrina Mill.	c		c/sb			c/sb	Paeoniaceae	1	R	LC		VU	VU	VU	Autochthonous
Reynoutria × *bohemica* Chrtek & Chrtková		s				s	Polygonaceae	1	R						Allochthonous
Reynoutria japonica Houtt.	c					c	Polygonaceae	1	R						Allochthonous
Ruscus aculeatus L.		c		c		c	Asparagaceae	1	R	LC		R	VU	EN	Autochthonous
Scilla bifolia L. s.l.			s	s	s	s	Asparagaceae	1	B	LC					Autochthonous
Scilla siberica Andrews			s		c	c	Asparagaceae	1	B						Allochthonous
Tulipa agenensis Redouté			c/sb	c/sb	c/sb	sb	Liliaceae	1	B	LC					Allochthonous

Tulipa clusiana Redouté					c	c	Liliaceae	1	B						Allochthonous
Tulipa gesneriana L.	c	c	c/sb	c/sb	c/sb	sb	Liliaceae	1	B	NA					Allochthonous
Tulipa greigii Regel					c	c	Liliaceae	1	B	LC					Allochthonous
Tulipa sylvestris L. s.l.				c	c	c	Liliaceae	1	B						Autochthonous

Abbreviations: c – cultivate; s – spontaneous; sb – subspontaneous: B – bulb; R – rhizome; T – tuberobulb; LC – Least Concern, NA – Not Available; NT – Not Threatened; DD – Data Deficient: R – rare; VU – vulnerable; EN – endangered.