



Original article

Spontaneous flora of O.V. Fomin Botanical Garden of Taras Shevchenko National University of Kyiv, Ukraine

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ABSTRACT

For the first time we compiled a full checklist of the spontaneous flora of O.V. Fomin Botanical Garden of Taras Shevchenko National University, Kyiv. Native (281) and alien (243) taxa of the flora were analyzed. Among the alien species there are 115 xenophytes (including 71 archaeophytes and 44 neophytes), 128 ergasiophygophytes (including 3 archaeophytes and 125 neophytes). Four species of alien plants were listed for the first time for the flora of Ukraine: *Arabis procurrens*, *Lactuca sibirica*, *Polanisia dodecandra* subsp. *trachysperma* and *Talinum paniculatum*. It was found that the alien fraction of the flora is dominated by a stable component (54.7%), and among the ergasiophygophytes, most taxa (86.3%) are unstable components. Among the native plants, those species with a polyregional distribution predominate. This ratio is typical for transformed flora that have lost their natural structure. Among the alien species, the majority are sub-Mediterranean (43.6%), American (23.9%) and Asian (18.1%) in origin. In the biomorphological structure of the species of native plants perennial grasses predominate (65.3%), among xenophytes - annual grasses are dominant (74.8%), and among ergasiophygophytes perennial grasses predominate (43.8%). But despite the large number of alien plants in the botanical garden, their invasion can be mostly contained. The most widespread invasive plant is *Parthenocissus vitacea*, in addition, a number of potentially invasive plants need monitoring, in particular *Parietaria officinalis*, *Phytolacca acinosa*, *Thladiantha dubia* and some others. In addition, there is a list of introductions which have high naturalization rates and over time could replenish the composition of the spontaneous flora.

KEY WORDS: flora structure, alien plants, escaped plants, naturalization, neophytes

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1. Introduction

The study of biodiversity remains an important topic of biological research. The floras of introduction centres (such as botanical gardens and arboretums) are very complex and dynamic biosystems.

O.V. Fomin Botanical Garden of Taras Shevchenko National University of Kyiv (further in the text – the Botanical Garden) is one of the first introduction centres in Ukraine. It was established in 1839, its development and operation is associated with the activities of prominent botanists of the XIX

century and the first half of the XX century: A.L. Andzheiovskyi, O.S. Rohovych, R.E. Trautfetter, I.F. Shmalhausen, O.V. Fomin, O.I. Sokolovskyi (O.V. FOMIN BOTANICAL GARDEN. CATALOGUE OF PLANTS, 2007). Taxonomic diversity of plants of the Botanical Garden has long attracted the attention of domestic botanists, in particular, the role of botanical collections in the emergence and distribution of new foreign plants of Ukraine was noticeable (ROGOVICH, 1869; PROTOPOPOVA, 1973; MOSYAKIN & YAVORSKA, 2001; MOSYAKIN & MOSYAKIN, 2021). Since the last inventory of wild plants of the

Botanical Garden (BEREZKINA ET AL., 2007), significant additions to its composition have been published (KONAIKOVA ET AL., 2015; BIOTA OF THE O.V. FOMIN BOTANICAL GARDEN, 2021). Therefore, to date, the accumulated information about the spontaneous flora of the Botanical Garden needed a new generalization.

The main objective was to conduct a full inventory of the spontaneous flora of the Botanical Garden and to generalize its taxonomic composition for the entire period of research.

2. Material and methods

2.1. Study area

The Botanical Garden is located in the central part of Kyiv. Today its area is 22.5 hectares, it consists of three functional parts; it has a park part, a scientific part and the area near the main building of the university.

Geographically, the garden is located on the northern edge of the Kyiv upland region of the Right Bank Forest-Steppe. The natural boundary between Polissya and the Forest-Steppe in our time can be traced in relief and runs in close proximity to the garden (Fig. 1).



Fig. 1. Location map of the Botanical Garden

The relief of the park part is very rugged and is represented by several ravines and steep, partially eroded slopes of the left side of the River Lybid valley. The soil cover of the Botanical Garden is represented by grey forest and sod-podzolic soils. At the time of the creation of the Botanical Garden, this area was fragmentarily covered with shrubs and forests, and part of it was used for urban landfill (HAVRYLIUK & RECHMEDIN, 1956; MARYNYCH ET AL., 2003; O.V. FOMIN BOTANICAL GARDEN CATALOGUE OF PLANTS, 2007).

It has been suggested that several ephemerooids in the spontaneous flora of the Botanical Garden,

including *Gagea minima* and *G. transversalis*, have remained here since the existence of deciduous forests in the River Lybid valley (PEREGRYM & CHEKALIN, 2014). However the natural vegetation of the territory of the Botanical Garden has not survived to this day, nor most of the original composition of planting laid down in the XIX century. Currently, the main habitats where spontaneous flora is represented are forest plantations, irrigated lawns and synanthropic areas.

2.2. Historical overview

In the XIX century the university botanical garden (research botanical garden) was the central introductory institution of the then Kyiv educational district, and due to the distribution of some invasive plants, it attracted the attention of botanists. Thus, ROHOVYCH (1869) noted that in 1842 *Cyclachaena xanthiifolia* was distributed from the Botanical Garden to ruderal habitats and by the 1860s had distributed to many places in old Kyiv and its environs. Somewhat later, V. Montrezor cited 13 species of native plants for the territory of the university garden (MONTREZOR, 1886-1890). SHMALHAUSEN (1897) pointed out *Mirabilis nyctaginea* from the Botanical Garden. In the XX century JAKUBOWSKIJ (1904) noted *Alliaria petiolata*, *Allium scorodoprasum*, *Bryonia alba*, *Bunias orientalis*, *Impatiens parviflora* and *Veronica teucrium* in the territory of the garden growing wild.

In Soviet times, OKSIUK (1924) indicated that *Phedimus spurius* and *Physochlaina orientalis* were growing wild in the territory of the Kyiv Botanical Garden, Yu.M. Semenkevych also indicated *Geranium pyrenaicum* and *Melica ciliata* (SEMENKEVYCH, 1925, 1926). In the middle of the last century MALUSCHYTSKA (1948) published a list of wild herbaceous plants of the botanical garden and this work became the first purposeful research in Ukraine, which was entirely devoted to the spontaneous flora of the introductory institution. In general, the author cited 220 taxa with different indicators of naturalization. Later, MALUSCHYTSKA (1949) noted alien taxa that were distributed across Kyiv from the Kyiv Botanical Garden: *Cyclachaena xanthiifolia*, *Impatiens parviflora*, *Mirabilis nyctaginea*, *Oxalis stricta*, partly *Asclepias syriaca* and *Galinsoga parviflora*. In the second half of the XX century and at the beginning of the XXI century there was fragmentary information about some wild species of plants in the territory of the University Botanical Garden in some publications (FLORA OF THE USSR, 1936-1965; PROTOPOPOVA, 1973; GOLYACHENKO ET AL., 1992; CHOPYK ET AL., 1998; MOSYAKIN & YAVORSKA, 2001; KOLISNICHENKO, 2005).

In the new century, a preliminary inventory of the modern varieties of wild tree and herbaceous plants of the Botanical Garden was prepared by V.I. Berezkina and co-authors (BEREZKINA ET AL., 2007). In general, the authors listed 245 species of spontaneous flora and initiated its monitoring. As of 2008, there were already 314 species in the flora and the structure of its current composition was studied (GUBAR & YAKUSHENKO, 2009). Later PEREGRYM & CHEKALIN (2014) showed the state of spontaneous populations of 14 bulbous and bulbotuberiferous plants in the Botanical Garden. Subsequently, KONAIKOVA ET AL. (2015) published a significant addition to the spontaneous flora of the Botanical Garden, which listed 119 species of plants first found here in 2009-2015. Some information about the studied flora during this period was published in other literature sources (ORLOV & GUBAR, 2009; MOSYAKIN & MOSYAKIN, 2021), and some are recorded on iNaturalist (BIOTA OF THE O.V. FOMIN BOTANICAL GARDEN, 2021).

Thus, the history of studying the spontaneous flora of the Botanical Garden began with the work of A. Rohovych and dates back more than 150 years. Until now, it was important to summarize all the above information to create a generalized checklist of the historical flora of the garden and its analysis.

2.3. Data and methods

The study was conducted within the territory of the Botanical Garden during 2021. Previous works on the study of wild plants of the Botanical Garden were used as the basis for the checklist (MALUSCHYTSKA, 1948; O.V. FOMIN BOTANICAL GARDEN. CATALOGUE OF PLANTS, 2007; KONAIKOVA ET AL., 2015) and fragmentary floristic information from other literary sources was utilised (SEMENKEVYCH, 1925, 1926; MALUSCHYTSKA, 1949; PROTOPOPOVA, 1974; GOLYACHENKO ET AL., 1992; KOLISNICHENKO, 2005; PEREGRYM & CHEKALIN, 2014). Herbaria were studied, these were: KW (The National Herbarium of Ukraine, Kyiv); KWA (Herbarium of the M.M. Gryshko National Botanical Garden, Kyiv); KWU (Taras Shevchenko National University, Kyiv, Ukraine); Herbarium of the Botanical Garden of Odessa I.I. Mechnikov National University; and LE (Herbarium of the Komarov Botanical Institute, Saint Petersburg, Russia). In addition, observations published on the Internet were also utilised (BIOTA OF THE O.V. FOMIN BOTANICAL GARDEN (KYIV), 2021). The nomenclature is according to GBIF (2021), and the full names of taxa are given in the appendices.

The general research of the spontaneous flora was carried out, with the experience of previous

similar research (BEREZKINA ET AL., 2007; KUZEMKO ET AL., 2011; VINOGRADOVA ET AL., 2015; SHYNDER ET AL., 2018; SHYNDER, 2019; SHYNDER & DOIKO, 2020; KOVTONIUK, 2021).

As part of the spontaneous flora, we considered wild plants that were not introduced directly, as well as escaped plant from the culture. The body of the flora was divided into immigration groups, which correspond to its division into native and alien fractions, and the latter were divided into groups according to the time and method of inclusion into the flora (PYŠEK ET AL., 2004; THELLUNG, 1922): *native plants* are plants whose natural range covers the study area; *xenophytes* are unintentionally introduced plants; *ergasiophygophytes* are alien plants that were introduced into the flora and later naturalized (*escaped plants*). Some researchers (BARANOVA ET AL., 2018) also single out the intermediate group of *xeno-ergasiophygophytes* – alien plants that were originally cultivated in some regions, but penetrated the studied flora independently; in our study, we classified such plants as xenophytes. Depending on the time of immigration alien plants are divided into two main groups: *archaeophytes* which are alien plants that penetrated the flora up to 1500; and *neophytes* are alien plants that have independently penetrated into the flora after 1500.

The origin of alien plants was compared with the works of: PROTOPOPOVA (1973), MOSYAKIN & YAVORSKA (2002), PROTOPOPOVA & SHEVERA (2014), et al., but the origin of some plants needed an explanation. In the work on the research topic (GUBAR & YAKUSHENKO, 2009) an important remark was made about the wild flora of the plants of the Forest-Steppe, which didn't grow naturally on the territory of the Botanical Garden: within its range the species cannot be alien. In this work we follow this approach, although debatable, but it greatly simplifies the study of spontaneous flora of introductory institutions. At the same time, we consider local species that grow exclusively in plantations, as part of the cultural flora.

In the course of studying the spontaneous flora of introductory institutions, the actual task was to distinguish between ergasiophygophytes (alien flora) and ergasiophytes (cultural flora). This question is covered in a previous article by one of the authors on the example of the spontaneous flora of the M.M. Gryshko National Botanical Garden of the National Academy of Sciences of Ukraine (SHYNDER, 2019a). In most cases, tree ergasiophytes were referred to as spontaneous flora when adult self-seeded individuals were detected at a distance of more than 100 m from adult trees, and grass ergasiophytes at more than 50 m. If the seed self-regeneration of introduced plants was recorded

within or near the collection and exhibition plantations, these taxa were considered to be part of the cultivated flora.

According to a similar principle, an optimized classification of invasive activity of ergasiophytes in the N.V. Tsitsin Main Botanical Garden (Moscow, Russia) (VINOGRADOVA ET AL., 2015), based on the project of European Botanical Gardens for the exchange of information on potentially invasive plants (SHARING INFORMATION AND POLICY ON THE POTENTIALLY INVASIVE PLANT IN BOTANIC GARDENS, 2021). There are four invasive statuses in this classification: 1 – alien plants, which are widespread in botanical garden and beyond (highly invasive species); 2 – plants that actively settle in botanical garden outside the collection plantations (invasive and highly invasive species); 3 – plants that have formed local populations outside of collection plantations, and vegetatively motile plants have formed stable clones that have lost their connection with the parent plants (potentially invasive species); 4 – plants that are at least once marked outside the collection plantations (not invasive) (VINOGRADOVA ET AL., 2015).

As can be seen, naturalized introducers, which are capable of self-renewal only within plantations, are not considered as part of the spontaneous flora. Therefore, in the course of the study, we reviewed the status of some plants that were listed as wild in the Botanical Garden.

The general checklist of flora (Appendix 1) includes all taxa of wild plants recorded during the entire period of research at the Botanical Garden. Instead, we consider the taxa of spontaneous flora recorded in the last 10 years as the modern (actual) composition of the flora. It includes taxa confirmed by us, as well as those listed in the work (KONAIKOVA ET AL., 2015). Most of the calculations are given

for the general checklist of the flora, and are the most important for its current composition.

The project «Biota of the O.V. Fomin Botanical Garden (Kyiv)» was created on the basis of the iNaturalist resource for research needs (BIOTA OF THE O.V. FOMIN BOTANICAL GARDEN, 2021). The observations of cultural and spontaneous flora of the Botanical Garden within its framework are covered. Samples of some plants found during the study were transferred to the herbaria of O.V. Fomin Botanical Garden (KWHU) and M.M. Gryshko National Botanical Garden (KWAH).

3. Results and discussion

It is obvious that the original flora of the territory of the Botanical Garden was forest with separate coastal-water and meadow species. The modern spontaneous flora of the Garden is an anthropically transformed flora in the conditions of the directed introduction of plants. According to the results of the inventory, it has been established that 524 taxa (species and subspecies) from 291 genera and 71 families have been recorded in the territory of the Botanical Garden. There are 281 native taxa and 243 alien taxa (Table 1). The current composition of the flora is 426 taxa, including 386 recorded by us.

For the first time we have recorded 4 taxa of alien plants for the flora of Ukraine from the territory of the Botanical Garden, these are *Arabis procurrens*, *Lactuca sibirica*, *Polanisia dodecandra* subsp. *trachysperma* and *Talinum paniculatum*. Also recorded for the first time for the flora of the Right-Bank Forest-Steppe and (or) the urban flora of Kyiv: *Cymbalaria muralis*, *Cyperus glomeratus*, *Phedimus stoloniferus*, *Ranunculus acris* subsp. *friesianus*, *Tradescantia × andersoniana*.

Table 1. Higher taxa of the spontaneous flora of the Botanic Garden

Higher taxa	Native fraction		Alien fraction	
	Number of species	%	Number of species	%
<i>Equisetophyta</i>	2	0.7	1	0.4
<i>Polypodiophyta</i>	1	0.4	-	-
<i>Pinophyta</i>	-	-	1	0.4
<i>Magnoliophyta</i>	278	98.9	241	99.6
including <i>Monocots</i>	47	16.7	29	13.7
<i>Eudicots</i>	231	82.2	212	85.9
Total	281	100.0	243	100.0

The level of species richness of the Botanical Garden seems to be quite high, compared to other commensurate institutions of equal size (SHYNDER, 2019b). In general, landscape monotony doesn't contribute to taxonomic representativeness, but

the study of spontaneous flora since the XIX century, allowed us to study its composition in detail. The level of adventization of the Garden's flora is 46.3% (its current composition is 47.9%). This level indicates the predominance of the anthropic factor

in the formation of the composition of the spontaneous flora over the natural one (SHYNDER, 2019b). It should be noted that the adventitia indicators obtained by us exceed the previously given ratio, which is about 35.4% (GUBAR & YAKUSHENKO, 2009). Probably, this is due to a detailed study of the taxonomic composition of ergasiophygophytes in the last period. In other scientific centers of plant introduction and acclimatization in Eastern Europe, this indicator is very different and depends on many factors, for example, in the M.M. Gryshko National Botanical Garden the level of adventization is 40.9% (SHYNDER, 2019b), in the Main Botanical Garden it is 40.0% (VINOGRADOVA ET AL., 2015), in the National Dendrological Park Sofiyivka of the

National Academy of Science of Ukraine (Uman, Ukraine) it is 19.1% (KOVTONIUK, 2021), in the State Dendrological Park «Alexandria» of NAS of Ukraine (Bila Tserkva, Ukraine) it is 31.2% (SHYNDER & DOIKO, 2020), in the Syrets dendrological park of national importance (Kyiv, Ukraine) it is 43.5% (SHYNDER ET AL., 2018).

According to the spectrum of leading families (Table 2), the native flora of the Botanical Garden belongs to the Rosaceae type, which is typical of Central and Northern Europe and the positions of the «boreal» family Cyperaceae and the «arid-Eurasian» family Fabaceae are lower. Such a family spectrum is inherent in the flora of broadly deciduous forest regions (KHOKHRYAKOV, 2000).

Table 2. The main families of the spontaneous flora of the Botanical Garden

Native fraction			Alien fraction		
№	Family	Number of species	№	Family	Number of species
1	Asteraceae	40	1	Asteraceae	39
2	Poaceae	25	2	Poaceae	19
3	Rosaceae	20	3	Brassicaceae	17
4	Lamiaceae	16	4	Amaranthaceae	15
5	Fabaceae	14	5	Fabaceae	10
6	Plantaginaceae	13	6	Rosaceae	9

In terms of the composition of the alien fraction on time of arrival kenophytes (70.8%) prevail over archaeophytes, which is typical for modern alien flora (Table 3). By origin, the flora is dominated by ergasiophygophytes (52.7%) which is typical for spontaneous flora of plant introduction and acclimatization centers (SHYNDER, 2019b). So, in the Main Botanical Garden this indicator is 53.8% (SHYNDER, 2019b), in the Main Botanical Garden its 85.4% (VINOGRADOVA ET AL., 2015), in the State Dendrological Park «Alexandria» it is 59.8% (SHYNDER & DOIKO, 2020), and in the urban flora agglomeration of Kyiv city it is 46.5% (MOSYAKIN & YAVORSKA, 2002).

According to the time of immigration, the spontaneous flora is dominated by neophytes (69.6%), and in addition, most archeophytes are xenophytes (Table 3). In the flora of the Botanical Garden among ergasiophygophytes there are only three archeophytes, according to (PROTOPOVA & SHEVERA, 2014): *Agrostemma githago*, *Althaea officinalis* and *Lycium barbatum*.

According to the degree of naturalization, alien species belong to two main components of flora: stable and temporary. The first component combines completely naturalized alien species (agriophytes, epecophytes). The temporary element

of the flora includes plants, which exist in the places of introduction only during one season or life expectancy of introduced individuals without the formation of subsequent generations (ephemero-phytes) or from a local population (colonophytes). It is advisable to include a large group of ergasiophygophytes, which are regularly dispersed or distributed by other means near the places of cultivation. Among the most pronounced patterns in the studied flora is the predominance of a stable component among archaeophytes, and among neophytes we observed the predominance of a temporary component (Table 3). In general, the stable component (54.7%) predominates in the alien fraction.

Among xenophytes, a stable component also predominates (79.6%), but among the ergasiophygophytes there is a very high proportion of unstable component (74.2%). This is expected for the flora of the plant introduction and acclimatization center, where a large number of ergasiophytes are at different stages of naturalization and different stages of exit from the cultivation. For comparison, in the alien flora of the Kyiv Agglomeration the share of the stable component is 46% (MOSYAKIN & YAVORSKA, 2002).

Table 3. Immigration structure of the alien fraction of the flora of the Botanical Garden

Category	The whole fraction		Stable component		Temporary component	
	Number of species	%	Number of species	%	Number of species	%
Xenophytes	115	47.3	100	75.2	15	13.7
Archaeophytes	71	29.2	65	48.9	6	5.5
Neophytes	44	18.1	35	26.3	9	8.2
Ergasiophygophytes	128	52.7	33	24.8	95	86.3
Archaeophytes	3	1.2	-		3	2.7
Neophytes	125	51.5	33	24.8	92	83.6
Total	243	100	133	100.0	110	100.0

The geographical structure of the native fraction has a very pronounced predominance of species from a wide area – Palearctic (together with Eurasian), Euro-Mediterranean and other similar geoelements (Table 4). Instead, the share of regional geoelements (European, forest-steppe, steppe, sub-Mediterranean, etc.), which mainly determine the geographical spectrum of the Ukrainian flora, is much lower and is 25.3%. Thus, the geographical spectrum showed that the studied flora is derived, due to the complete absence of natural vegetation.

Among alien flora taxa, those of sub-Mediterranean origin predominate (43.6%), as well as American (23.9%) and Asian (18.1%) (Table 5). The spontaneous flora of Dendrological Park «Alexandria» and M.M. Gryshko National Botanical Garden have a similar structure (SHYNDER & DOIKO, 2020). Fractional analysis allows us to clarify the geographical structure of both different immigration groups of the alien fraction. Thus, among xenophytes, the share of the sub-Mediterranean element is 53.0%, which gives the whole group a clear southern character. The ergasiophygophytes are dominated by species of sub-Mediterranean (35.1%) and

American (31.3%) Origin. This spectrum can be described as multi-regional and it indicates the diverse introductory activity of the Botanical Garden, thanks to which plants from different continents have naturalized in Kyiv.

Table 4. Geographical structure of the native fraction of the flora of the Botanical Garden

Geoelement	Number of species	%
Palearctic	127	45.2
Euro-Mediterranean	54	19.2
European	22	12.4
Holarctic	19	6.8
Pluriregional	10	3.5
Boreal	8	2.9
Sub-Mediterranean	7	2.5
Central European	6	2.1
European-Siberian	5	1.8
Eurasian steppe	5	1.8
Eurasian forest-steppe	3	1.1
Eastern European	2	0.7
Total	281	100.0

Table 5. Geographical structure of the alien fraction of the flora of the Botanical Garden

Geoelement	Number of species					%
	Xenophytes		Ergasiophygophytes		The whole fraction	
	Archaeophytes	Neophytes	Archaeophytes	Neophytes		
American	-	18	-	40	58	23.9
Eurasian	1	1	-	3	5	2.1
Asian	14	8	2	20	44	18.1
Sub-Mediterranean	48	13	-	45	106	43.6
European	3	3	-	11	17	7.0
Paleotropic	1	1	-	-	2	0.8
Anthropic	3	-	1	6	10	4.1
Not clarified	1	-	-	-	1	0.4
Total	71	44	3	125	243	100.0

The biomorphological structure of the flora is formed in accordance with the existing abiotic conditions, the same applies to its individual fractions, the corresponding spectra of which are radically different (Table 6). Among the native species, perennial grasses predominate (65.3%), among xenophytes - annual grasses are dominant (74.8%, including 74.6% among archaeophytes and 75.0% among neophytes), but among ergasiophygophytes these are dominated by perennial grasses (43.8%), also high proportions of trees (25.8%) and annual grasses (19.5%). A similar biomorphological structure was observed for the spontaneous flora of the National Botanical Garden (SHYNDER, 2019b), Dendrological Park «Alexandria» (SHYNDER & DOIKO, 2020), and Main Botanical Garden (VINOGRADOVA ET AL., 2015). This division is explained by the different ways of forming the native fraction of

the flora and includes several groups of the alien fraction. Xenophytes have migrated a distance of many thousands of kilometers and biomorphologically the most adapted were low-growing biomorphs; among which the most expansive were annuals, but trees and shrubs are not represented among such plants. Instead, the introductory work in the Botanical Garden contributed to the active naturalization of woody and herbaceous perennials directly in the conditions of continental Ukraine. Thus, among the introduced plants, the tendency to naturalization and high competitiveness are found mainly in perennial biomorphs, and among them the share of woody plants is the largest, compared to other immigration groups. It should be noted that the predominance of annuals is a characteristic feature of alien floras (PROTOPOVA, 1973).

Table 6. Biomorphological structure of the spontaneous flora of the Botanical Garden

Biomorphs	Native fraction		Alien fraction							
			Xenophytes				Ergasiophygo- phytes	The whole fraction		
			Archaeophytes		Neophytes					
	Number of species	%	Nmber of species	%	Number of species	%	Number of species	%	Number of species	%
Trees	15	5.4	-	-	-	-	33	25.8	33	13.6
Shrubs	8	2.8	-	-	-	-	6	4.7	6	2.5
Small shrub	2	0.7	1	1.4	-	-	-	-	1	0.4
Sub-shrub	2	0.7	-	-	-	-	-	-	-	-
Wood lianas	1	0.4	-	-	-	-	4	3.1	4	1.6
Annual herbs	40	14.3	53	74.6	33	75.0	25	19.5	111	45.7
Biennial herbs	29	10.4	8	11.3	3	6.8	4	3.1	15	6.2
Perennial herbs	183	65.3	9	12.7	8	18.2	56	43.8	73	30.0
Water herbs	-	-	-	-	-	-	-	-	-	-
Total	280	100.0	71	100.0	44	100.0	128	100.0	243	100.0

Important in the study of spontaneous flora is the analysis of invasive plant species. On the territory of the O.V. Fomin Botanical Garden grows some alien highly invasive species, but their expansion is largely contained. Currently, the most widespread invasive plant is *Parthenocissus vitacea*. Other highly invasive ergasiophygophytes have been retained or even eradicated, for example *Asclepias syriaca*, *Heracleum mantegazzianum*, *H. sosnowskyi*, *Solidago canadensis*, etc.. Several potentially invasive plants need to be monitored as they tend to increase in number and occupied area, these are specifically: *Parietaria officinalis*, *Phytolacca acinosa*, *Thladiantha dubia*, and some others.

4. Conclusions

O.V. Fomin Botanical Garden is one of the first scientific centers of plant introduction and acclimatization in Ukraine, which has existed for

more than 150 years, and for a long time an extremely rich spontaneous flora with a complex immigration, geographical and biomorphological structure has formed there. It was established that 524 taxa of wild plants were recorded here during the whole research period, 281 of them are native and 243 are alien. Among the alien plants, 115 xenophytes (71 archaeophytes and 44 neophytes), and 128 ergasiophygophytes (3 archaeophytes and 125 neophytes) were identified. It is noted that the studied flora has not preserved its original native features and is completely transformed. In particular, taxa with a wide distribution range predominate among native plants and their geographical structure has almost no typical regional features.

For the first time the full checklist of spontaneous flora is presented and a structural analysis is carried out. It is established, that in the alien fraction of the flora in general the stable component prevails

(54.7%), but among the ergasiophygophytes most species (86.3%) belong to the unstable component. Alien species are dominated by plants of sub-Mediterranean (43.6%), American (23.9%) and Asian (18.1%) origins. In the biomorphological structure among the native species perennial grasses predominate (65.3%), among the xenophytes - annual grasses are dominant (74.8%), while among ergasiophygophytes perennial grasses predominate (43.8%) and there is a high proportion of trees (25.8%).

From the middle of the XIX century to the present day, the Botanical Garden has become a centre for the spread of a number of alien plant species, in particular *Cyclachaena xanthiifolia*, *Galinsoga parviflora*, *Oxalis stricta* and others. At the same time, now phytointvasions in the Botanical Garden are mostly contained. Currently, the most widespread invasive plant is *Parthenocissus vitacea*, in addition, a number of potentially invasive plants need monitoring, in particular *Parietaria officinalis*, *Phytolacca acinosa*, *Thladiantha dubia* and some others.

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Appendices

Appendix 1. Checklist of spontaneous flora of o.v. fomin botanical garden (For The Whole Research Period 1869–2021)

For each taxon, its immigration characteristics ("native" - native plant, "xenophyte", "ergasioph." - ergasiophytophyte, "(arch.)" - archeophyte, "(neo.)" - neophyte) and literary or other sources (where mentioned) are given. The sign "!!" marked taxa that were confirmed in 2021.

HORSETAILS

EQUISETACEAE

1. *Equisetum arvense* L.: native, – (Berezkina et al., 2007); !!
2. *Equisetum hyemale* L.: native, – (Montezor, 1886; Flora..., 1936)
3. *Equisetum ramosissimum* Desf.: xenophyte (neo.), – (Konaikova et al., 2015)

LEPTOSPORANGIATE FERN

DRYOPTERIDACEAE

4. *Dryopteris filix-mas* (L.) Schott: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!

GYMNOSPERMS

TAXACEAE

5. *Taxus baccata* L.: ergasioph. (neo.), – !!

ANGIOSPERMS. Clade MONOCOTS

AMARYLLIDACEAE

6. *Allium altissimum* Regel: ergasioph. (neo.), – !! (Fig. 2). – Note. *Allium giganteum* Regel was previously reported for the Botanical Garden in culture (OV Fomin..., 2007) and in three introductory populations with a total area of 400 m² (Peregrym, Chekalin, 2014) - we assume that these are the same plants that we identified as *A. altissimum*. This taxon needs further monitoring.
7. *Allium angulosum* L.: native, – (Berezkina et al., 2007)
8. *Allium decipiens* Fisch. ex Schult. & Schult.f.: ergasioph. (neo.), – (Maluschytska, 1948)
9. *Allium oleraceum* L.: native, – !!
10. *Allium rotundum* L.: native, – (Maluschytska, 1948)
11. *Allium scorodoprasum* L.: xenophyte (arch.), – (Jakubowskij, 1904); !!
12. *Allium tuberosum* Rottler ex Spreng.: ergasioph. (neo.), – !!

ASPARAGACEAE

13. *Asparagus officinalis* L.: native, – (Konaikova et al., 2015); !!

14. *Convallaria majalis* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
15. *Muscari neglectum* Guss. ex Ten.: ergasioph. (neo.), – (Maluschytska, 1948; Berezkina et al., 2007); !!
16. *Ornithogalum boucheanum* (Kunth) Asch.: ergasioph. (neo.), – (Maluschytska, 1948; Peregrym, Chekalin, 2014)
17. *Ornithogalum fimbriatum* Willd.: ergasioph. (neo.), – (Maluschytska, 1948; Flora..., 1950; Chopyk et al., 1998; Peregrym, Chekalin, 2014); (Biota..., 2021)
18. *Ornithogalum orthophyllum* Ten. subsp. *kochii* (Parl.) C.Zahariadi: ergasioph. (neo.), – (Maluschytska, 1948); !!
19. *Polygonatum latifolium* (Jacq.) Desf.: native, – !!
20. *Polygonatum multiflorum* (L.) All.: native, – (Berezkina et al., 2007); !!
21. *Scilla bifolia* L.: native, – (In herbarium KW); (Maluschytska, 1948; Berezkina et al., 2007; Hrytsay, 2010; Peregrym, Chekalin, 2014); !!
22. *Scilla siberica* Andrews: native, – (Maluschytska, 1948; Berezkina et al., 2007; Peregrym, Chekalin, 2014); !!

COMMELINACEAE

23. *Commelina communis* L.: ergasioph. (neo.), – !!
24. *Tradescantia × andersoniana* W.Ludw. & Rohweder: ergasioph. (neo.), – !!

CYPERACEAE

25. *Carex caryophyllea* Latour.: native, – (Konaikova et al., 2015)
26. *Carex divulsa* Stokes: native, – !!
27. *Carex hirta* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
28. *Carex praecox* Schreb.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
29. *Carex sylvatica* Huds.: native, – (Konaikova et al., 2015); !!
30. *Cyperus glomeratus* L.: xenophyte (neo.), – !!

HEMEROCALLIDACEAE

31. *Hemerocallis lilioasphodelus* L.: ergasioph. (neo.), – (Flora..., 1950)

IRIDACEAE

32. *Iris pseudacorus* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007)

JUNCACEAE

33. *Juncus compressus* Jacq.: native, – (Maluschytska, 1948; Konaikova et al., 2015)
34. *Luzula campestris* (L.) DC.: native, – (Berezkina et al., 2007); !!
35. *Luzula pilosa* (L.) Willd.: native, – (Konaikova et al., 2015)

LILIACEAE

36. *Gagea lutea* (L.) Ker Gawl.: native, – (Berezkina et al., 2007); !! – Note. *The population of this species is small and is represented only in the experimental part of the Botanical Garden, so there is reason to believe that its origin is artificial (Peregrym, Chekalin, 2014)*
37. *Gagea minima* (L.) Ker Gawl.: native, – (Maluschytska, 1948; Berezkina et al., 2007; Peregrym, Chekalin, 2014); !!
38. *Gagea transversalis* Steven: native, – (Maluschytska, 1948; Peregrym, Chekalin, 2014)

POACEAE

39. *Agrostis canina* L.: native, – (Berezkina et al., 2007); !!
40. *Alopecurus arundinaceus* Poir.: native, – (Berezkina et al., 2007)
41. *Alopecurus pratensis* L.: native, – (Maluschytska, 1948); !!
42. *Anthoxanthum odoratum* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007)
43. *Apera spica-venti* (L.) P.Beauv.: xenophyte (arch.), – (Konaikova et al., 2015)
44. *Arrhenatherum elatius* (L.) P.Beauv. ex J.Presl & C.Presl: ergasioph. (neo.), – (Konaikova et al., 2015); !!
45. *Avena sativa* L.: ergasioph. (neo.), – (Konaikova et al., 2015)
46. *Brachypodium sylvaticum* (Huds.) P.Beauv.: native, – (Konaikova et al., 2015); !!
47. *Bromus carinatus* Hook. & Arn.: ergasioph. (neo.), – !!
48. *Bromus hordeaceus* L.: xenophyte (arch.), – (Maluschytska, 1948); !!
49. *Bromus inermis* Leyss.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
50. *Bromus tectorum* L.: xenophyte (arch.), – (Berezkina et al., 2007; Maluschytska, 1948); !!
51. *Calamagrostis epigejos* (L.) Roth: native, – !!
52. *Dactylis glomerata* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
53. *Deschampsia cespitosa* (L.) P.Beauv.: native, – (Maluschytska, 1948)
54. *Digitaria sanguinalis* (L.) Scop.: xenophyte (arch.), – (Konaikova et al., 2015); !!
55. *Echinochloa crus-galli* (L.) P.Beauv.: xenophyte (arch.), – (Maluschytska, 1948; Berezkina et al., 2007); !!
56. *Elymus caninus* (L.) L.: native, – !!
57. *Elymus repens* (L.) Gould: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
58. *Eragrostis minor* Host: xenophyte (neo.), – (Maluschytska, 1948; Berezkina et al., 2007); !!
59. *Eragrostis pectinacea* (Michx.) Nees: xenophyte (neo.), – (Konaikova et al., 2015)
60. *Eragrostis pilosa* (L.) P.Beauv.: xenophyte (neo.), – (Konaikova et al., 2015); !!
61. *Festuca rubra* L.: native, – (Maluschytska, 1948); !!
62. *Festuca valesiaca* Schleich. ex Gaudin: native, – (Maluschytska, 1948; Konaikova et al., 2015); !!
63. *Hordeum murinum* L. subsp. *murinum*: xenophyte (arch.), – !!
64. *Hordeum murinum* subsp. *leporinum* (Link) Arcang.: xenophyte (neo.), – (Konaikova et al., 2015)
65. *Lolium giganteum* (L.) Darbysh.: native, – !!
66. *Lolium multiflorum* Lam.: ergasioph. (neo.), – (Konaikova et al., 2015)
67. *Lolium perenne* L.: native, – (Maluschytska, 1948; Konaikova et al., 2015); !!
68. *Lolium pratense* (Huds.) Darbysh.: native, – (Konaikova et al., 2015); !!
69. *Melica altissima* L.: native, – (Maluschytska, 1948; Konaikova et al., 2015); !!
70. *Melica ciliata* L.: ergasioph. (neo.), – (Semenkevych, 1926).
71. *Melica nutans* L.: native, – (Konaikova et al., 2015); !!
72. *Poa annua* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
73. *Poa bulbosa* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
74. *Poa compressa* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
75. *Poa nemoralis* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
76. *Poa palustris* L.: native, – (Berezkina et al., 2007)
77. *Poa pratensis* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
78. *Sclerochloa dura* (L.) P.Beauv.: xenophyte (arch.), – !!
79. *Setaria pumila* (Poir.) Roem. & Schult.: xenophyte (arch.), – (Maluschytska, 1948; Berezkina et al., 2007); !!
80. *Setaria verticillata* (L.) P.Beauv.: xenophyte (arch.), – !!
81. *Setaria viridis* (L.) P.Beauv.: xenophyte (arch.), – (Maluschytska, 1948; Berezkina et al., 2007); !!

82. *Thinopyrum intermedium* (Host) Barkworth & D.R.Dewey: native, – (Berezkina et al., 2007); !!

ANGIOSPERMS. Clade EUDICOTS

ADOXACEAE

83. *Adoxa moschatellina* L.: native, – (Maluschytska, 1948)

84. *Sambucus ebulus* L.: native, – (Berezkina et al., 2007)

85. *Sambucus nigra* L.: native, – (Berezkina et al., 2007); !!

AMARANTHACEAE

86. *Amaranthus albus* L.: xenophyte (neo.), – !!

87. *Amaranthus blitoides* S.Watson: xenophyte (neo.), – !!

88. *Amaranthus blitum* L.: ergasioph. (neo.), – (Berezkina et al., 2007)

89. *Amaranthus cruentus* L.: ergasioph. (neo.), – (Biota..., 2021); !!

90. *Amaranthus retroflexus* L.: xenophyte (neo.), – (Maluschytska, 1948; Berezkina et al., 2007); !!

91. *Atriplex hortensis* L.: ergasioph. (neo.), – (Konaikova et al., 2015)

92. *Atriplex oblongifolia* Waldst. & Kit.: native, – !!

93. *Atriplex patula* L.: native, – (Berezkina et al., 2007); !!

94. *Atriplex rosea* L.: xenophyte (arch.), – (Maluschytska, 1948)

95. *Atriplex sagittata* Borkh.: xenophyte (arch.), – (Maluschytska, 1948; Konaikova et al., 2015); !!

96. *Bassia scoparia* (L.) A.J.Scott subsp. *scoparia*: ergasioph. (neo.), – (Maluschytska, 1948)

97. *Chenopodium hybridum* (L.) S.Fuentes, Uotila & Borsch: xenophyte (arch.), – (Maluschytska, 1948; Konaikova et al., 2015); !!

98. *Chenopodium album* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!

99. *Chenopodium opulifolium* Schrad.: xenophyte (arch.), – !!

100. *Chenopodium strictum* Roth: xenophyte (arch.?), – (Konaikova et al., 2015); !!

101. *Chenopodium suecicum* Murr.: xenophyte (neo.), – (Konaikova et al., 2015); !!

102. *Kali tragus* Scop. subsp. *tragus*: ?xenophyte (neo.), – (Konaikova et al., 2015)

103. *Lipandra polysperma* (L.) S.Fuentes, Uotila & Borsch: xenophyte (arch.?), – (Maluschytska, 1948; Konaikova et al., 2015); !!

104. *Oxybasis glauca* (L.) S.Fuentes, Uotila & Borsch: native, – (Konaikova et al., 2015)

APIACEAE

105. *Aegopodium podagraria* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!

106. *Aethusa cynapium* L.: native, – !!

107. *Anethum graveolens* L.: ergasioph. (neo.), – (Konaikova et al., 2015)

108. *Angelica archangelica* L.: native, – (Konaikova et al., 2015)

109. *Anthriscus sylvestris* (L.) Hoffm.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!

110. *Carum carvi* L.: native, – (Maluschytska, 1948); !!

111. *Conium maculatum* L.: xenophyte (arch.), – (Berezkina et al., 2007); !!

112. *Daucus carota* L. subsp. *carota*: native, – (Berezkina et al., 2007); !!

113. *Heracleum mantegazzianum* Sommier & Levier: ergasioph. (neo.), – (Maluschytska, 1948; Berezkina et al., 2007). – *Note. There is an old herbarium voucher of this species: "Kiev Botanical Garden", 08.1917, V. Lipsky (herbarium of the Botanical Garden of I.I. Mechnykov Odesa National University); now the species has disappeared.*

114. *Heracleum sosnowskyi* Manden.: ergasioph. (neo.), – (Berezkina et al., 2007)

115. *Heracleum sphondylium* L. subsp. *sibiricum* (L.) Simonk.: native, – (Berezkina et al., 2007); !!

116. *Pastinaca sativa* subsp. *sylvestris* (Mill.) Rouy & Camus: native, – (Berezkina et al., 2007); !!

117. *Pimpinella saxifraga* L.: native, – !!

118. *Selinum carvifolia* (L.) L.: native, – (Maluschytska, 1948)

119. *Seseli annuum* L.: native, – (Montrezor, 1890)

120. *Torilis japonica* (Houtt.) DC.: native, – (Berezkina et al., 2007); !!

APOCYNACEAE

121. *Apocynum cannabinum* L.: ergasioph. (neo.), – (Biota..., 2021); !! (Fig. 3)

122. *Asclepias syriaca* L.: ergasioph. (neo.), – (Maluschytska, 1948, 1949; Berezkina et al., 2007); !!

123. *Vinca minor* L.: ergasioph. (neo.), – (Berezkina et al., 2007); !!

124. *Vincetoxicum hirundinaria* Medik.: native, – (Maluschytska, 1948; Konaikova et al., 2015); !!

ARISTOLOCHIACEAE

125. *Aristolochia clematitis* L.: native, – (Berezkina et al., 2007); !!

ASTERACEAE (Asteroideae)

126. *Achillea collina* (Wirtg.) Becker ex Rchb.: native, – !!

127. *Achillea millefolium* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); (Biota..., 2021). – *Note. It is possible that all indications for this species apply to A. collina.*

128. *Achillea pannonica* Scheele: native, – !!

129. *Achillea salicifolia* Besser: native, – (Maluschytska, 1948)

130. *Ambrosia artemisiifolia* L.: Xeno-ergasiophytes, – (Konaikova et al., 2015); !!

131. *Anthemis arvensis* L.: xenophyte (arch.), – (Berezkina et al., 2007)

132. *Anthemis cotula* L.: xenophyte (arch.), – (Konaikova et al., 2015)

133. *Anthemis ruthenica* M.Bieb.: native, – (Maluschytska, 1948); !!

134. *Arctium* × *ambiguum* (Celak) Nym.: native, – !!

135. *Arctium lappa* L.: native, – (Berezkina et al., 2007); !!

136. *Arctium minus* (Hill) Bernh.: native, – !!

137. *Arctium* × *nothum* (Ruhmer) J.Weiss: native, – !!

138. *Arctium tomentosum* Mill.: native, – (Maluschytska, 1948; Berezkina et al., 2007)

139. *Artemisia absinthium* L.: xenophyte (arch.), – (Maluschytska, 1948; Berezkina et al., 2007)

140. *Artemisia annua* L.: xenophyte (neo.), – (Konaikova et al., 2015); !!

141. *Artemisia austriaca* Jacq.: native, – (Montrezor, 1890); !!

142. *Artemisia marschalliana* Spreng.: native, – (Maluschytska, 1948)

143. *Artemisia vulgaris* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!

144. *Bellis perennis* L.: ergasioph. (neo.), – (Maluschytska, 1948; Berezkina et al., 2007)

145. *Bidens frondosa* L.: xenophyte (neo.), – (Berezkina et al., 2007); !!

146. *Bidens tripartita* L.: native, – (Berezkina et al., 2007)

147. *Carduus acanthoides* L.: xenophyte (arch.), – (Maluschytska, 1948; Berezkina et al., 2007)

148. *Carduus crispus* L.: native, – (Berezkina et al., 2007); !!

149. *Centaurea cyanus* L.: xenophyte (arch.), – (Maluschytska, 1948; Konaikova et al., 2015)
 150. *Centaurea jacea* L.: native, – (Maluschytska, 1948); !!
 151. *Centaurea scabiosa* L.: native, – (Berezkina et al., 2007)
 152. *Cirsium arvense* (L.) Scop. var. *arvense*: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 153. *Cirsium arvense* var. *integrifolium* Wimm. & Grab.: native, – (Montrezor, 1890); !!
 154. *Cirsium decussatum* Janka: native, – (Montrezor, 1890)
 155. *Cirsium palustre* (L.) Scop.: native, – (Berezkina et al., 2007)
 156. *Coreopsis grandiflora* Hogg ex Sw.: ergasioph. (neo.), – !!
 157. *Cosmos bipinnatus* Cav.: ergasioph. (neo.), – (Konaikova et al., 2015)
 158. *Cyclachaena xanthiifolia* (Nutt.) Fresen.: ergasioph. (neo.), – (Rogovich, 1869; Maluschytska, 1948, 1949); !!
 159. *Erechtites hieracifolia* (L.) Raf. ex DC.: xenophyte (neo.), – !! (Fig. 4)
 160. *Erigeron acris* L. subsp. *acris*: native, – (Montrezor, 1890)
 161. *Erigeron annuus* (L.) Pers.: xenophyte (neo.), – (Maluschytska, 1948; Berezkina et al., 2007); !!
 162. *Erigeron canadensis* L.: xenophyte (neo.), – (Maluschytska, 1948; Konaikova et al., 2015); !!
 163. *Galinsoga parviflora* Cav.: xenophyte (neo.), – Herbariums vouchers (KWU; 1924, V. Lipsky, in the herbarium of the Botanical Garden of I.I. Mechnykov Odesa National University); (Maluschytska, 1948, 1949; Berezkina et al., 2007); !!
 164. *Galinsoga quadriradiata* Ruiz & Pav.: xenophyte (neo.), – (Mosyakin, Yavorska, 2001; Konaikova et al., 2015)
 165. *Helianthus annuus* L.: ergasioph. (neo.), – !!
 166. *Helianthus tuberosus* L.: ergasioph. (neo.), – (Berezkina et al., 2007); !!
 167. *Helichrysum arenarium* (L.) Moench: native, – (Maluschytska, 1948)
 168. *Hypochaeris radicata* L.: native, – !!
 169. *Inula britannica* L.: native, – (Maluschytska, 1948; Maluschytska, 1948)
 170. *Inula helenium* L.: ergasioph. (neo.), – (Berezkina et al., 2007); !!
 171. *Jacobaea vulgaris* Gaertn.: native, – (Montrezor, 1890)
 172. *Leucanthemum vulgare* Lam.: native, – (Montrezor, 1890; Maluschytska, 1948; Berezkina et al., 2007)
 173. *Matricaria chamomilla* L.: xenophyte (arch.), – (Maluschytska, 1948; Konaikova et al., 2015); !!
 174. *Matricaria discoidea* DC.: xenophyte (neo.), – (Maluschytska, 1948); !!
 175. *Senecio vernalis* Waldst. & Kit.: xenophyte (neo.), – (Berezkina et al., 2007; Konaikova et al., 2015); !!
 176. *Senecio vulgaris* L.: xenophyte (arch.), – (Maluschytska, 1948; Berezkina et al., 2007); !!
 177. *Silphium perfoliatum* L.: ergasioph. (neo.), – (Maluschytska, 1948; Mosyakin, Yavorska, 2001); !!
 178. *Solidago canadensis* L.: ergasioph. (neo.), – (In herbarium KWU); (Berezkina et al., 2007); !!
 179. *Symphotrichum novi-belgii* (L.) G.L.Nesom: ergasioph. (neo.), – (Konaikova et al., 2015); !!
 180. *Tagetes erecta* L.: ergasioph. (neo.), – (Konaikova et al., 2015)
 181. *Tanacetum parthenium* (L.) Sch.Bip.: ergasioph. (neo.), – (Konaikova et al., 2015); !!
 182. *Tanacetum vulgare* L.: native, – (Berezkina et al., 2007); !!
 183. *Telekia speciosa* (Schreb.) Baumg.: ergasioph. (neo.), – (Berezkina et al., 2007)
 184. *Tripleurospermum inodorum* (L.) Sch.Bip.: xenophyte (arch.), – (Maluschytska, 1948); !!
 185. *Tussilago farfara* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 186. *Xanthium albinum* (Holub) Holub: xenophyte (neo.), – !!
- ASTERACEAE (Cichorioideae)
187. *Cichorium intybus* L.: xenophyte (arch.), – (Maluschytska, 1948; Berezkina et al., 2007); !!
 188. *Crepis sancta* (L.) Bornm.: xenophyte (neo.), – (Konaikova et al., 2015)
 189. *Hieracium umbellatum* L.: native, – (Maluschytska, 1948); !!
 190. *Lactuca serriola* L.: xenophyte (arch.), – (Maluschytska, 1948; Konaikova et al., 2015); !!
 191. *Lactuca sibirica* (L.) Maxim.: ergasioph. (neo.), – !! (Fig. 5)
 192. *Lapsana communis* L.: native, – (Konaikova et al., 2015); !!
 193. *Picris hieracioides* L.: native, – (Konaikova et al., 2015); !!
 194. *Pilosella caespitosa* (Dumort.) P.D.Sell & C.West: native, – (Maluschytska, 1948)
 195. *Pilosella floribunda* (Wimm. & Grab.) Fr.: native, – !!
 196. *Pilosella officinarum* F.Schultz & Sch.Bip.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 197. *Scorzoneroides autumnalis* (L.) Moench: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 198. *Sonchus arvensis* L. subsp. *arvensis*: xenophyte (arch.), – !!
 199. *Sonchus arvensis* subsp. *uliginosus* (M.Bieb.) Nyman: native, – (Konaikova et al., 2015); !!
 200. *Sonchus asper* (L.) Hill: xenophyte (arch.), – (Konaikova et al., 2015); !!
 201. *Sonchus oleraceus* L.: xenophyte (arch.), – (In herbarium KWU); (Maluschytska, 1948; Berezkina et al., 2007); !!
 202. *Taraxacum officinale* L. s.l.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 203. *Tragopogon dubius* L. subsp. *major* (Jacq.) Vollm.: native, – (Montrezor, 1890); !!
 204. *Tragopogon orientalis* L.: native, – (Maluschytska, 1948)
- BALSAMINACEAE
205. *Impatiens parviflora* DC.: xenophyte (neo.), – (Berezkina et al., 2007; Maluschytska, 1948, 1949; Jakubowski, 1904); !!
- BETULACEAE
206. *Corylus avellana* L.: native, – !!
 207. *Corylus pontica* K.Koch: ergasioph. (neo.), – !!
- BIGNONIACEAE
208. *Catalpa speciosa* (Warder ex Barney) Warder ex Engelm.: ergasioph. (neo.), – !!
- BORAGINACEAE
209. *Anchusa officinalis* L.: xenophyte (arch.), – (Maluschytska, 1948; Berezkina et al., 2007); !!
 210. *Cynoglossum officinale* L.: xenophyte (arch.), – (Maluschytska, 1948)
 211. *Echium vulgare* L.: native, – (Maluschytska, 1948; Konaikova et al., 2015)
 212. *Myosotis arvensis* (L.) Hill: xenophyte (arch.), – (Berezkina et al., 2007); !!
 213. *Myosotis stricta* Link ex Roem. & Schult.: native, – (Berezkina et al., 2007)
 214. *Myosotis sparsiflora* Pohl: native, – (Maluschytska, 1948); (Biota..., 2021); !!
 215. *Memoremea scorpioides* (Haenke) A.Otero, Jim.Mejías, Valcárcel & P.Vargas: native, – !!
 216. *Pulmonaria obscura* Dumort.: native, – (Berezkina et al., 2007); !!
 217. *Symphytum officinale* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 218. *Symphytum peregrinum* Ledeb.: ergasioph. (neo.), – !!
 219. *Symphytum tauricum* Willd.: ergasioph. (neo.), – (Maluschytska, 1948; Berezkina et al., 2007); !!

BRASSICACEAE

220. *Alliaria petiolata* (M.Bieb.) Cavara & Grande: native, – (Jakubowski, 1904; Berezkina et al., 2007; Maluschytska, 1948); !!
221. *Arabidopsis thaliana* (L.) Heynh.: native, – (Berezkina et al., 2007); !!
222. *Arabis procurrens* Waldst. & Kit.: ergasioph. (neo.), – !!
223. *Armoracia rusticana* P.Gaertn., B.Mey. & Scherb.: ergasioph. (neo.), – !!
224. *Barbarea vulgaris* (L.) W.T. Aiton s.l. (incl. *B. arcuata* (Opiz) Rchb.): native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
225. *Berteroa incana* (L.) DC.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
226. *Brassica rapa* L. subsp. *oleifera* (DC.) Metzg.: xenophyte (arch.), – (Berezkina et al., 2007); !!
227. *Bunias orientalis* L.: xenophyte (neo.), – (Jakubowski, 1904; Maluschytska, 1948; Konaikova et al., 2015); !!
228. *Capsella bursa-pastoris* (L.) Medik.: xenophyte (arch.), – (Maluschytska, 1948; Berezkina et al., 2007); !!
229. *Descurainia sophia* (L.) Webb ex Prantl: xenophyte (arch.), – (Berezkina et al., 2007); !!
230. *Diplotaxis tenuifolia* (L.) DC.: xenophyte (neo.), – !!
231. *Erysimum cheiranthoides* L.: xenophyte (arch.), – (Maluschytska, 1948; Berezkina et al., 2007); !!
232. *Hesperis matronalis* L.: xenophyte (arch.), – (Maluschytska, 1948)
233. *Lepidium draba* L.: xenophyte (neo.), – (Berezkina et al., 2007); !!
234. *Lepidium ruderales* L.: xenophyte (arch.), – (Maluschytska, 1948; Berezkina et al., 2007); !!
235. *Lobularia maritima* (L.) Desv.: ergasioph. (neo.), – !!
236. *Lunaria annua* L.: ergasioph. (neo.), – (Maluschytska, 1948); !!
- 236b. *Neslia paniculata* (L.) Desv.: «Kiev in horto Universitatis», 1908, leg. Khitrovo (ex herbarium LE № 4124), quoted for (Schedae..., 1957). –
Note. *They may have been cultivated plants.*
237. *Raphanus raphanistrum* L.: xenophyte (arch.), – (Berezkina et al., 2007)
238. *Raphanus sativus* L.: ergasioph. (neo.), – !!
239. *Rorippa palustris* (L.) Besser: native, – (Maluschytska, 1948); !!
240. *Sisymbrium altissimum* L.: native, – (Maluschytska, 1948); !!
241. *Sisymbrium officinale* (L.) Scop.: xenophyte (arch.), – (Maluschytska, 1948; Berezkina et al., 2007); !!
242. *Thlaspi arvense* L.: xenophyte (arch.), – (Maluschytska, 1948; Konaikova et al., 2015); !!

CAMPANULACEAE

243. *Campanula bononiensis* L.: native, – !!
244. *Campanula patula* L.: native, – (Maluschytska, 1948; Konaikova et al., 2015); !!
245. *Campanula rapunculoides* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007)

CANNABACEAE

246. *Celtis occidentalis* L.: ergasioph. (neo.), – (Kolishchenko, 2005); !!
247. *Celtis occidentalis* var. *pumila* (Muhl.) Pursh: ergasioph. (neo.), – !!
248. *Humulus lupulus* L.: native, – (Berezkina et al., 2007); !!

CAPRIFOLIACEAE

249. *Cephalaria gigantea* (Ledeb.) Bobrov: ergasioph. (neo.), – (Maluschytska, 1948)
250. *Dipsacus laciniatus* L.: native, – (Maluschytska, 1948)
251. *Knautia arvensis* (L.) Coult.: native, – (Montezor, 1890; Maluschytska, 1948); !!
252. *Scabiosa ochroleuca* L.: native, – (Maluschytska, 1948; Konaikova et al., 2015)
253. *Valerianella carinata* Loisel.: xenophyte (neo.), – !!

CARYOPHYLLACEAE

254. *Agrostemma githago* L.: ergasioph. (arch.), – (Berezkina et al., 2007)
255. *Cerastium arvense* L.: native, – (Berezkina et al., 2007)
256. *Cerastium holosteoides* Fries: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
257. *Dianthus armeria* L.: native, – !!
258. *Herniaria glabra* L.: native, – (Berezkina et al., 2007)
259. *Myosoton aquaticum* (L.) Moench: native, – (Berezkina et al., 2007); !!
260. *Petrorhagia saxifraga* (L.) Link: ergasioph. (neo.), – (Konaikova et al., 2015); !!
261. *Saponaria officinalis* L.: ergasioph. (neo.), – (Maluschytska, 1948; Konaikova et al., 2015); !!
262. *Silene vulgaris* (Moench) Garcke: native, – (Maluschytska, 1948; Konaikova et al., 2015); !!
263. *Silene latifolia* Poir. subsp. *alba* (Miller) Greuter & Burdet: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
264. *Stellaria holostea* L.: native, – (Maluschytska, 1948); (Biota..., 2021); !!
265. *Stellaria media* (L.) Vill.: native, – (LE); (Maluschytska, 1948; Berezkina et al., 2007; Grechyskina, 2010); !!
266. *Viscaria vulgaris* Roehl.: native, – (Berezkina et al., 2007)

CELASTRACEAE

267. *Celastrus orbiculatus* C.P.Thunberg ex A.Murray: ergasioph. (neo.), – !!
268. *Euonymus verrucosus* Scop.: native, – !!

CLEOMACEAE

269. *Polanisia dodecandra* (L.) DC. subsp. *trachysperma* (Torr. & A.Gray) Iltis: ergasioph. (neo.), – !!

CONVOLVULACEAE

270. *Calystegia sepium* (L.) R.Br.: native, – (Berezkina et al., 2007); !!
271. *Convolvulus arvensis* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!

CORNACEAE

272. *Cornus sanguinea* subsp. *australis* (C.A.Mey.) Jáv.: ergasioph. (neo.), – !!
273. *Cornus sanguinea* subsp. *hungarica* (Kárpáti) Soó: ergasioph. (spontaneous hybrid), – !!

CRASSULACEAE

274. *Hylotelephium maximum* (L.) J.Holub subsp. *maximum*: native, – (Konaikova et al., 2015); !!
275. *Phedimus spurius* (M.Bieb.) 't Hart: ergasioph. (neo.), – (Maluschytska, 1948; Oksiuk, 1924; Berezkina et al., 2007); !!
- 275b. *Phedimus crenatus* (Desf.) V.V.Byalt (= *P. spurius* s.l.): ergasioph. (neo.), – (Flora..., 1953) . – Note. *Currently, P. crenatus is not considered an independent taxon (GBIF, 2021; POWO, 2021)*
276. *Phedimus stoloniferus* (S.G.Gmel.) 't Hart: ergasioph. (neo.), – !!
277. *Sedum acre* L.: native, – (Berezkina et al., 2007); !!
278. *Sedum album* L.: ergasioph. (neo.), – (Berezkina et al., 2007)
279. *Sedum pallidum* M.Bieb.: ergasioph. (neo.), – (Berezkina et al., 2007); !!
280. *Sedum sexangulare* L.: ergasioph. (neo.), – !!

CUCURBITACEAE

281. *Bryonia alba* L.: ergasioph. (neo.), – (Jakubowski, 1904); !!

282. *Echinocystis lobata* (Michx.) Torr. & A.Gray: xenophyte (neo.), – (Konaikova et al., 2015)
 283. *Thladiantha dubia* Bunge: ergasioph. (neo.), – (Flora..., 1961; Konaikova et al., 2015); !!
- EUPHORBIACEAE**
284. *Euphorbia angulata* Jacq.: native, – !!
 285. *Euphorbia cyparissias* L.: native, – (Berezkina et al., 2007); !!
 286. *Euphorbia esula* L. subsp. *tommasiniana* (Bertol.) Kuzmanov (= *E. virgultosa* Klokov): native, – (Konaikova et al., 2015)
 287. *Euphorbia peplus* L.: xenophyte (arch.), – (Berezkina et al., 2007); !!
 288. *Euphorbia plathyphyllos* L.: xenophyte (arch.), – (Konaikova et al., 2015)
- FABACEAE**
289. *Cercis canadensis* L.: ergasioph. (neo.), – (Konaikova et al., 2015); !!
 290. *Galega orientalis* Lam.: ergasioph. (neo.), – !!
 291. *Gleditsia triacanthos* L.: ergasioph. (neo.), – (Konaikova et al., 2015); !!
 292. *Gymnocladus dioica* (L.) K.Koch: ergasioph. (neo.), – (Mosyakin, Yavorska, 2001; Konaikova et al., 2015); !!
 293. *Lathyrus sylvestris* L.: native, – (Montezor, 1887)
 294. *Lathyrus vernus* (L.) Bernh.: native, – (Konaikova et al., 2015); !!
 295. *Lotus corniculatus* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 296. *Lupinus polyphyllus* Lindl.: ergasioph. (neo.), – (Berezkina et al., 2007)
 297. *Medicago falcata* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 298. *Medicago lupulina* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 299. *Medicago sativa* L.: ergasioph. (neo.), – (Maluschytska, 1948); !!
 300. *Melilotus albus* Medik.: native, – (Berezkina et al., 2007); !!
 301. *Melilotus officinalis* (L.) Lam.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 302. *Robinia pseudoacacia* L.: ergasioph. (neo.), – (Kolischenko, 2005; Berezkina et al., 2007); !!
 303. *Trifolium arvense* L.: native, – (Berezkina et al., 2007)
 304. *Trifolium hybridum* L.: ergasioph. (neo.), – (Maluschytska, 1948)
 305. *Trifolium medium* L.: native, – (Konaikova et al., 2015)
 306. *Trifolium pratense* L.: native, – (Maluschytska, 1948; Konaikova et al., 2015); !!
 307. *Trifolium repens* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007; Konaikova et al., 2015); !!
 308. *Trifolium rubens* L.: ergasioph. (neo.), – (Konaikova et al., 2015)
 309. *Vicia cracca* L.: native, – (Montezor, 1887; Maluschytska, 1948; Berezkina et al., 2007); !!
 310. *Vicia sativa* L. subsp. *nigra* (L.) Ehrh.: xenophyte (neo.), – !!
 311. *Vicia sepium* L.: native, – !!
 312. *Vicia tetrasperma* (L.) Schreb.: xenophyte (arch.), – !!
- FAGACEAE**
313. *Quercus coccinea* Münchh.: ergasioph. (neo.), – (Kolischenko, 2005)
 314. *Quercus robur* L.: native, – (Berezkina et al., 2007); !!
 315. *Quercus rubra* L.: ergasioph. (neo.), – (Kolischenko, 2005; Berezkina et al., 2007); (Biota..., 2021); !!
- GERANIACEAE**
316. *Erodium cicutarium* (L.) L'Her.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 317. *Geranium divaricatum* Erhr.: native, – (In herbarium KW); (Konaikova et al., 2015)
 318. *Geranium molle* L.: xenophyte (neo.), – (Maluschytska, 1948)
 319. *Geranium pratense* L.: native, – (Berezkina et al., 2007)
 320. *Geranium pusillum* L.: xenophyte (arch.), – (Maluschytska, 1948; Berezkina et al., 2007); !!
 321. *Geranium pyrenaicum* Burm.f.: ergasioph. (neo.), – (Semenkevych, 1925; Maluschytska, 1948); !!
 322. *Geranium robertianum* L.: native, – (Berezkina et al., 2007); !!
 323. *Geranium sanguineum* L.: native, – (Konaikova et al., 2015); !!
 324. *Geranium sibiricum* L.: Xeno-ergasiophytes, – (Semenkevych, 1926; Maluschytska, 1948; Berezkina et al., 2007); !!
- HYPERICACEAE**
325. *Hypericum perforatum* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007)
- JUGLANDACEAE**
326. *Juglans cinerea* L.: ergasioph. (neo.), – !!
 327. *Juglans mandshurica* Maxim.: ergasioph. (neo.), – !!
 328. *Juglans nigra* L.: ergasioph. (neo.), – !!
 329. *Juglans regia* L.: ergasioph. (neo.), – (Berezkina et al., 2007); !!
- LAMIACEAE**
330. *Ajuga genevensis* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 331. *Ajuga reptans* L.: native, – (Konaikova et al., 2015)
 332. *Ballota nigra* L. subsp. *nigra*: xenophyte (arch.), – (Berezkina et al., 2007); !!
 333. *Clinopodium acinos* (L.) Kuntze: native, – (Konaikova et al., 2015); !!
 334. *Clinopodium vulgare* L.: native, – (In herbarium KWU)
 335. *Elsholtzia ciliata* (Thunb.) Hyl.: Xeno-ergasiophytes, – (Mosyakin, Yavorska, 2001); !!
 336. *Galeopsis bifida* Boenn.: native, – !!
 337. *Glechoma hederacea* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 338. *Lamium album* L.: xenophyte (arch.), – (Maluschytska, 1948; Berezkina et al., 2007); !!
 339. *Lamium amplexicaule* L.: xenophyte (arch.), – (Berezkina et al., 2007); !!
 340. *Lamium galeobdolon* (L.) L.: native, – (Konaikova et al., 2015); !!
 341. *Lamium maculatum* (L.) L.: native, – (Maluschytska, 1948; Konaikova et al., 2015); !!
 342. *Lamium purpureum* L.: xenophyte (arch.), – (Maluschytska, 1948; Berezkina et al., 2007); !!
 343. *Leonurus quinquelobatus* Gilib.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 344. *Melissa officinalis* L.: ergasioph. (neo.), – (Biota..., 2021); !!
 345. *Mentha arvensis* L.: native, – (Berezkina et al., 2007)
 346. *Mentha spicata* L.: ergasioph. (neo.), – (Konaikova et al., 2015)
 347. *Mentha × piperita* L.: ergasioph. (neo.), – (Konaikova et al., 2015)
 348. *Perilla frutescens* (L.) Britton var. *crispa* (Thunb.) H.Deane: ergasioph. (neo.), – !!
 349. *Prunella vulgaris* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 350. *Salvia pratensis* L.: native, – (Maluschytska, 1948; Konaikova et al., 2015)
 351. *Salvia verticillata* L.: native, – (Konaikova et al., 2015); !!

352. *Stachys palustris* L.: native, – (Berezkina et al., 2007); !!
 353. *Stachys sylvatica* L.: native, – !!
 354. *Thymus pulegioides* L. subsp. *pannonicus* (All.) Kerguelen: native, – (Maluschytska, 1948; Berezkina et al., 2007)
- LINACEAE
 355. *Linum usitatissimum* L.: ergasioph. (neo.), – !!
- MALVACEAE
 356. *Abutilon theophrasti* Medik.: ergasioph. (neo.), – (Maluschytska, 1948; Mosyakin, Yavorska, 2001); !!
 357. *Alcea rugosa* Alef.: ergasioph. (neo.), – !!
 358. *Althaea officinalis* L.: ergasioph. (arch.), – (Konaikova et al., 2015)
 359. *Hibiscus trionum* L.: xenophyte (arch.), – (Maluschytska, 1948)
 360. *Malva thuringiaca* Vis.: native, – (Maluschytska, 1948); !!
 361. *Malva neglecta* Wallr.: xenophyte (arch.), – (Maluschytska, 1948; Berezkina et al., 2007); !!
 362. *Malva sylvestris* L.: xenophyte (arch.), – (Maluschytska, 1948); !!
- MORACEAE
 363. *Morus alba* L.: ergasioph. (neo.), – !!
- NYCTAGINACEAE
 364. *Mirabilis nyctaginea* (Michx.) Mac Mill.: ergasioph. (neo.), – (Shmalhausen, 1897; Flora..., 1952; Maluschytska, 1948, 1949; Konaikova et al., 2015); !!
- OLEACEAE
 365. *Fraxinus excelsior* L.: native, – (Berezkina et al., 2007); !!
 366. *Fraxinus pennsylvanica* Marshall: ergasioph. (neo.), – (Kolisinichenko, 2005); !!
 367. *Syringa vulgaris* L.: ergasioph. (neo.), – (Berezkina et al., 2007); !!
- ONAGRACEAE
 368. *Epilobium angustifolium* L.: native, – (Berezkina et al., 2007)
 369. *Epilobium hirsutum* L.: native, – (Konaikova et al., 2015); !!
 370. *Epilobium parviflorum* Schreb.: native, – (Maluschytska, 1948; Konaikova et al., 2015)
 371. *Epilobium tetragonum* L.: native, – (In herbarium KWU); !!
 372. *Oenothera biennis* L.: xenophyte (neo.), – (Maluschytska, 1948; Berezkina et al., 2007)
 373. *Oenothera rubricaulis* Kleb.: xenophyte (neo.), – (Rostanski, 2004); !!
- OROBANCHACEAE
 374. *Lathraea squamaria* L.: native, – (Berezkina et al., 2007); !!
 375. *Odontites vulgaris* Moench: native, – (Konaikova et al., 2015)
- OXALIDACEAE
 376. *Oxalis corniculata* L.: xenophyte (neo.), – (Maluschytska, 1948; Berezkina et al., 2007)
 376b. *O. c. var. atropurpurea* (Van Houtte) P.Fourn.: xenophyte, – !!
 377. *Oxalis dillenii* Jacq.: xenophyte (neo.), – (Protopopova, 1974); !!
 378. *Oxalis stricta* L.: xenophyte (neo.), – (Maluschytska, 1948, 1949; Konaikova et al., 2015); !!
- PAPAVERACEAE
 379. *Chelidonium majus* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 380. *Corydalis cava* (L.) Schweigg. & Körte: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 381. *Corydalis solida* (L.) Clairv.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 382. *Eschscholzia californica* Cham.: ergasioph. (neo.), – (Mosyakin, Yavorska, 2001).
 383. *Papaver rhoeas* L.: xenophyte (arch.), – (Berezkina et al., 2007)
- PHYTOLACCACEAE
 384. *Phytolacca acinosa* Roxb.: ergasioph. (neo.), – !!
 385. *Phytolacca americana* L.: ergasioph. (neo.), – (Berezkina et al., 2007); !! (Fig. 6)
- PLANTAGINACEAE
 386. *Chaenorhinum minus* (L.) Lange: native, – !!
 387. *Cymbalaria muralis* G.Gaertn., B.Mey. & Scherb.: ergasioph. (neo.), – !!
 388. *Linaria vulgaris* Mill.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 389. *Plantago lanceolata* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 390. *Plantago major* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 391. *Plantago media* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 392. *Veronica agrestis* L.: xenophyte (arch.), – (Berezkina et al., 2007)
 393. *Veronica arvensis* L.: xenophyte (arch.), – !!
 394. *Veronica beccabunga* L.: native, – (In herbarium KW)
 395. *Veronica cardiocarpa* (Kar. & Kir.) Walp.: xenophyte (neo.), – (In herbarium KWU, № 18821; Golyachenko et al., 1992; Chopyk et al., 1998); !!
 396. *Veronica chamaedrys* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 397. *Veronica filiformis* Sm.: ergasioph. (neo.), – (Golyachenko et al., 1992); !!
 398. *Veronica officinalis* L.: native, – !!
 399. *Veronica opaca* Fr.: xenophyte (arch.), – (Berezkina et al., 2007)
 400. *Veronica polita* Fr.: xenophyte (arch.), – (Maluschytska, 1948); !!
 401. *Veronica prostrata* L.: native, – (Maluschytska, 1948)
 402. *Veronica serpyllifolia* L.: native, – (Maluschytska, 1948); !!
 403. *Veronica spicata* L.: native, – (Maluschytska, 1948; Konaikova et al., 2015); !!
 404. *Veronica sublobata* M.Fischer: native?, – (Biota..., 2021); !!
 405. *Veronica teucrium* L.: native, – (Jakubowskij, 1904)
 406. *Veronica triphylos* L.: xenophyte (arch.), – (Berezkina et al., 2007)
- POLYGONACEAE
 407. *Fagopyrum tataricum* (L.) Gaertn.: xenophyte (neo.), – (Berezkina et al., 2007)
 408. *Fallopia dumetorum* (L.) Holub: native, – (Berezkina et al., 2007); !!
 409. *Persicaria hydropiper* (L.) Spach: native, – (Berezkina et al., 2007); !!
 410. *Persicaria lapathifolia* (L.) Gray subsp. *pallida* (With.) S.Ekman & T.Knutsson: native, – !!
 411. *Persicaria maculosa* Gray: native, – (Maluschytska, 1948; Konaikova et al., 2015); !!
 412. *Polygonum arenastrum* Boreau: native, – (Konaikova et al., 2015); !!
 413. *Polygonum aviculare* L. subsp. *aviculare*: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 414. *Polygonum aviculare* subsp. *neglectum* (Besser) Arcang.: native, – !!

415. *Reynoutria bohemica* Chrték & Chrtková: ergasioph. (neo.), – (Konaikova et al., 2015); !!
 416. *Rumex acetosella* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007) (Biota..., 2021)
 417. *Rumex confertus* Willd.: native, – (Maluschytska, 1948; Berezkina et al., 2007)
 418. *Rumex crispus* L.: native, – !!
 419. *Rumex obtusifolius* L. subsp. *obtusifolius*: xenophyte (neo.), – (Konaikova et al., 2015); !!
 420. *Rumex obtusifolius* subsp. *sylvestris* (Lam.) Celak.: native, – !!
 421. *Rumex patientia* L. subsp. *patientia*: ergasioph. (neo.), – !!
 422. *Rumex thyrsiflorus* Fingerh.: native, – (Konaikova et al., 2015); !!
- PORTULACACEAE
 423. *Portulaca oleracea* L.: xenophyte (arch.), – (Maluschytska, 1948; Berezkina et al., 2007); !!
- PRIMULACEAE
 424. *Lysimachia arvensis* (L.) U.Manns & Anderb.: xenophyte (arch.), – (Berezkina et al., 2007)
 425. *Lysimachia nummularia* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 426. *Lysimachia vulgaris* L.: native, – (Berezkina et al., 2007); !!
 427. *Primula veris* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007)
- RANUNCULACEAE
 428. *Anemone nemorosa* L.: native, – (Berezkina et al., 2007)
 429. *Anemone ranunculoides* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 430. *Aquilegia vulgaris* L.: ergasioph. (neo.), – !!
 431. *Clematis vitalba* L.: ergasioph. (neo.), – (Konaikova et al., 2015); !!
 432. *Consolida regalis* Gray subsp. *regalis*: xenophyte (arch.), – (Konaikova et al., 2015); !!
 433. *Ficaria verna* Huds.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 434. *Nigella damascena* L.: ergasioph. (neo.), – !!
 435. *Ranunculus acris* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 436. *Ranunculus acris* subsp. *friesianus* (Jordan) Syme (= *R. stevenii* Andrzej.): ergasioph. (neo.), – !!
 437. *Ranunculus illyricus* L.: native, – (Maluschytska, 1948)
 438. *Ranunculus polyanthemus* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 439. *Ranunculus repens* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 440. *Thalictrum minus* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007)
- RHAMNACEAE
 441. *Frangula alnus* Mill.: native, – (Berezkina et al., 2007)
 442. *Rhamnus cathartica* L.: native, – !!
- ROSACEAE
 443. *Agrimonia eupatoria* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 444. *Agrimonia procera* Wallr.: native, – !!
 445. *Alchemilla baltica* Sam. ex Juz.: ergasioph. (neo.), – (Berezkina et al., 2007)
 446. *Alchemilla vulgaris* L.: native, – (Konaikova et al., 2015)
 447. *Argentina anserina* (L.) Rydb.: native, – (Berezkina et al., 2007); !!
 448. *Crataegus coccinea* L.: ergasioph. (neo.), – !!
 449. *Crataegus mollis* (Torr. & A.Gray) Scheele: ergasioph. (neo.), – !!
 450. *Crataegus rhipidophylla* Gand.: native, – (Berezkina et al., 2007); !!
 451. *Fragaria vesca* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 452. *Geum rivale* L.: native, – (Berezkina et al., 2007)
 453. *Geum urbanum* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 454. *Malus domestica* Borkh.: ergasioph. (neo.), – !!
 455. *Potentilla argentea* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 456. *Potentilla indica* (Andrews) T.Wolf: ergasioph. (neo.), – (Berezkina et al., 2007); !!
 457. *Potentilla intermedia* L.: native, – (Maluschytska, 1948)
 458. *Potentilla norvegica* L.: native, – (In herbarium KWU)
 459. *Potentilla reptans* L.: native, – (In herbarium KWU); Berezkina et al., 2007); !!
 460. *Prunus armeniaca* L.: ergasioph. (neo.), – !!
 461. *Prunus avium* (L.) L.: native, – !!
 462. *Prunus cerasifera* Ehrh.: ergasioph. (neo.), – !!
 462b. *P. c. f. pissardii* (Carrière) Koehne: ergasioph., - !!
 463. *Prunus cerasus* L.: ergasioph. (neo.), – !!
 464. *Prunus padus* L.: native, – !!
 465. *Prunus tomentosa* Thunb.: ergasioph. (neo.), – !!
 466. *Rosa canina* L.: native, – !!
 466b. Appendix
 467. *Rosa corymbifera* Borkh.: native, – !!
 468. *Rubus caesius* L.: native, – (Berezkina et al., 2007); !!
 469. *Sanguisorba officinalis* L.: native, – (Konaikova et al., 2015)
 470. *Sorbus aucuparia* L.: native, – (Berezkina et al., 2007); !!
- RUBIACEAE
 471. *Galium odoratum* (L.) Scop.: native, – (Berezkina et al., 2007); !!
 472. *Galium aparine* L.: native, – (Berezkina et al., 2007); !!
 473. *Galium spurium* L.: xenophyte (arch.), – (Maluschytska, 1948; Berezkina et al., 2007)
 474. *Galium uliginosum* L.: native, – (Konaikova et al., 2015)
 475. *Galium verum* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
 476. *Galium mollugo* L.: native, – (Berezkina et al., 2007); !!
- SALICACEAE
 477. *Populus alba* L.: native, – (Berezkina et al., 2007); !!
 478. *Populus canadensis* Moench: ergasioph. (neo.), – !!
 479. *Populus canescens* Sm.: native, – !!
 480. *Populus simonii* Carrière: ergasioph. (neo.), – (Konaikova et al., 2015); !!
 481. *Salix caprea* L.: native, – !!
 482. *Salix triandra* L.: native, – !!

SANTALACEAE

483. *Viscum album* L. subsp. *album*: native, – (Berezkina et al., 2007); !!

SAPINDACEAE

484. *Acer campestre* L.: native, – !!
485. *Acer negundo* L.: ergasioph. (neo.), – (In herbarium KWU; Kolisnichenko, 2005; Berezkina et al., 2007); !!
486. *Acer platanoides* L.: native, – (Berezkina et al., 2007); !!
487. *Acer pseudoplatanus* L.: native?, – (Berezkina et al., 2007); !!
488. *Acer saccharinum* L.: ergasioph. (neo.), – (Konaikova et al., 2015)
489. *Acer tataricum* L.: native, – (Konaikova et al., 2015); !!
490. *Aesculus hippocastanum* L.: ergasioph. (neo.), – (Kolisnichenko, 2005; Berezkina et al., 2007); !!

SCROPHULARIACEAE

491. *Scrophularia nodosa* L.: native, – (Konaikova et al., 2015); !!
492. *Verbascum lychnitis* L.: native, – (Montezor, 1888; Maluschytska, 1948); !!
493. *Verbascum phlomoides* L.: native, – !!

SIMAROUBACEAE

494. *Ailanthus altissima* (Mill.) Swingle: ergasioph. (neo.), – (Konaikova et al., 2015); !!

SOLANACEAE

495. *Alkekengi officinarum* Moench: ergasioph. (neo.), – (Konaikova et al., 2015)
496. *Datura stramonium* L.: xenophyte (neo.), – (Maluschytska, 1948; Konaikova et al., 2015)
496b. *D. stramonium* f. *tatula* (L.) D. Geerinck & E. Walravens: xenophyte (neo.), – (Biota..., 2021)!!
497. *Hyoscyamus niger* L.: xenophyte (neo.), – (Maluschytska, 1948); !!
498. *Lycium barbarum* L.: ergasioph. (arch.), – (Konaikova et al., 2015); !!
499. *Nicotiana tabacum* L.: ergasioph. (neo.), – !!
500. *Physochlaina orientalis* (M.Bieb.) G.Don: ergasioph. (neo.), – (Oksiuk, 1924; Protopopova, 1973).
501. *Solanum dulcamara* L.: native, – (Konaikova et al., 2015); !!
502. *Solanum lycopersicum* L.: ergasioph. (neo.), – !!
503. *Solanum nigrum* L. subsp. *nigrum*: xenophyte (arch.), – (Maluschytska, 1948; Berezkina et al., 2007)
504. *Solanum nigrum* subsp. *schultesii* (Opiz) Wessely.: xenophyte (neo.), – !!

TALINACEAE

505. *Talinum paniculatum* (Jacq.) Gaertn.: ergasioph. (neo.), – !! (Fig. 7)

TILIACEAE

506. *Tilia cordata* Mill.: native, – (In herbarium KWU; Konaikova et al., 2015); !!
507. *Tilia* × *europaea* L.: ergasioph. (neo.), – !!
508. *Tilia platyphyllos* Scop.: ergasioph. (neo.), – (Berezkina et al., 2007)

ULMACEAE

509. *Ulmus glabra* Huds.: native, – (Berezkina et al., 2007; Konaikova et al., 2015); !!
510. *Ulmus laevis* Pall.: native, – (Berezkina et al., 2007); !!
511. *Ulmus pumila* L.: ergasioph. (neo.), – (Kolisnichenko, 2005; Berezkina et al., 2007); !!

URTICACEAE

512. *Parietaria officinalis* L.: ergasioph. (neo.), – (In herbariums KWH & KWU); (Chopyk et al., 1998; Berezkina et al., 2007; Mosyakin, Mosyakin, 2021); !!
513. *Urtica dioica* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
514. *Urtica urens* L.: xenophyte (arch.), – (Maluschytska, 1948; Berezkina et al., 2007)

VERBENACEAE

515. *Verbena officinalis* L.: xenophyte (arch.), – (Konaikova et al., 2015); !!

VIOLACEAE

516. *Viola reichenbachiana* Jord. ex Boreau: native, – (Berezkina et al., 2007)
517. *Viola canina* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
518. *Viola mirabilis* L.: native, – (Maluschytska, 1948)
519. *Viola odorata* L.: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
520. *Viola tricolor* L. subsp. *matutina* (Klokov) Valentine: native, – (Maluschytska, 1948; Berezkina et al., 2007); !!
521. *Viola arvensis* Murray: xenophyte (arch.), – (Berezkina et al., 2007); !!
522. *Viola sororia* Willd.: ergasioph. (neo.), – !!

VITACEAE

523. *Parthenocissus vitacea* (Knerr) Hitchc.: ergasioph. (neo.), – (Berezkina et al., 2007); !!
524. *Vitis riparia* Michx.: ergasioph. (neo.), – !!

Appendix 2. Additional checklist of cultivated plants, which have different degrees of naturalization, but did not move out of cultural plots (according to the method used there is no reason to consider these species as part of the spontaneous flora as ergasiophygophytes ("escaped plants"); some of these plants may indeed grow spontaneously, detached from the cultural plantations, but this should be confirmed by further monitoring observations). *The sign "!!" marked taxa that were confirmed in 2021.*

Abies alba Mill.: Self-seed was observed!!

Adonis vernalis L.: Grows singly in the central part of the Botanical Garden (Berezkina et al., 2007). - Note. Obviously it is a cultivated plant.

Allium carinatum L.: Self-seed was observed!!

Allium grande Lipsky: Alone on the slopes opposite the main orangery; has no tendency to spread (Maluschytska, 1948)

Allium pervestitum Klokov: grows singly in the central part of the Botanical Garden (Berezkina et al., 2007)

Allium sphaerocephalon L.: Self-seed was observed!!

Allium ursinum L.: Behind the main orangery, grows in a group (near a beech), as wild (Maluschytska, 1948)

Amorpha fruticosa L.: Abundant self-seeds were observed (Kolisnichenko, 2005). – Note. *We did not see spontaneously growing plants outside the primary cultivation sites.*

Aquilegia olympica Boiss.: On an alpine hill, like wild (Maluschytska, 1948)

Aruncus dioicus (Walter) Fernald: As wild (Konaikova et al., 2015)

Berberis vulgaris L.: Self-seed was observed!!

Broussonetia papyrifera (L.) Vent.: Propagated by rhizomes!!

Campanula latifolia L.: Grows like wild, but has no tendency to spread (Maluschytska, 1948)

Campsis radicans (L.) Bureau: On lawns, occasionally; as an adventitious plant (Konaikova et al., 2015); At the bottom of a shaded ravine, a small plant; apparently entered with plant remains!!

Carex pallescens L.: Occasionally, on lawns in the central part of the Botanical Garden (Berezkina et al., 2007).

Carya cordiformis (Wangenh.) C.Koch: Self-seed is observed!!

Catalpa ovata G.Don: Self-seed is observed!!

Chaenomeles japonica (Thunb.) Lindl. ex Spach: On the lawn above the playground, alone; as an adventitious plant (Konaikova et al., 2015)

Clematis orientalis L.: On the lawn near the administrative building (Berezkina et al., 2007)

Cotoneaster spp. – Note. *In the Botanical Garden, self-seeding plants were recorded in most of the 30 cultivated species of the genus, which reached generative age (Grevtsova, Kazanskaya, 1997)*

Cotoneaster dielsianus E.Pritz.: Abundant self-seed is observed (Grevtsova, Kazanskaya, 1997)

Cotoneaster divaricatus Rehder & E.H.Wilson: Abundant self-seed is observed (Grevtsova, Kazanskaya, 1997)

Cotoneaster hupehensis Rehder & E.H.Wilson: Abundant self-seed is observed (Grevtsova, Kazanskaya, 1997)

Cotoneaster laxiflorus (J.Jacq.) Lindl.: Abundant self-seed is observed (Grevtsova, Kazanskaya, 1997)

Cotoneaster lucidus Schldt.: Abundant self-seed is observed (Grevtsova, Kazanskaya, 1997); !!

Cotoneaster nitens Rehder & E.H.Wilson: Abundant self-seed is observed (Grevtsova, Kazanskaya, 1997)

Cotoneaster nummularius Fisch. & C.A.Mey.: Self-seed is observed!!

Cotoneaster obscurus Rehder & E.H.Wilson: Abundant self-seed is observed (Grevtsova, Kazanskaya, 1997)

Cotoneaster pekinensis (Koehne) Zabel: Abundant self-seed is observed (Grevtsova, Kazanskaya, 1997)

Cotoneaster przewalskii Pojark.: Abundant self-seed is observed (Grevtsova, Kazanskaya, 1997)

Cotoneaster roseus Edgew.: Abundant self-seed is observed (Grevtsova, Kazanskaya, 1997)

Cotoneaster rotundifolius Wall. ex Lindl. (= *C. nitidus* Jacq.): Abundant self-seed is observed (Grevtsova, Kazanskaya, 1997)

Cotoneaster suavis Pojark.: Self-seed is observed!!

Cotoneaster tenuipes Rehder & E.H.Wilson: Abundant self-seed is observed (Grevtsova, Kazanskaya, 1997)

Cotoneaster zabelii C.K.Schneid.: Abundant self-seed is observed (Grevtsova, Kazanskaya, 1997)

Crataegus crus-galli L.: Self-seed is observed, 19.09.2021!!

Crataegus pinnatifida Bunge: Self-seed is observed and, clogs the plantings (Kolischenko, 2005)

Crocus banaticus J.Gay: Grows in several areas with intensive watering; the area of the spontaneous population is about 2000 m², the density reaches 300 individuals per 1 m² (Peregrym, Chekalin, 2014)

Crocus heuffelianus Herb.: Between the stones on a stone hill, as wild (Maluschytska, 1948); The spontaneous population in the scientific part consists of 3 fragments with a total area of about 3000 m², but low density, up to 20-30 individuals per 1 m² (Peregrym, Chekalin, 2014)

Crocus reticulatus Steven ex Adam: In the north-eastern part of the Botanical Garden on the lawn, alone; as wild, but has no tendency to spread (Maluschytska, 1948)

Crocus speciosus M.Bieb.: Near the main greenhouse on the lawn; as wild, but has no tendency to spread (Maluschytska, 1948); forms dense thickets in the experimental part, near the greenhouse (Berezkina et al., 2007). – Note. *Apparently, this and other species of the genus Crocus have formed large populations in the areas where they were planted; we do not see any facts of escape outside culture.*

Delphinium cuneatum Steven ex DC.: Near the collection of *Corylus* on piles of plant remains, rarely, 16.06.2018, leg. V.P. Kolomiychuk (In herbarium KWHU)

Eranthis hyemalis (L.) Salisb.: Self-seed is observed (inaturalist.org/observations/71859135)

Euphorbia myrsinites L.: Self-seed is observed!!

Fritillaria ruthenica Wikst.: Alone in the northeastern part of the Botanical Garden on the lawn; as wild, but has no tendency to spread (Maluschytska, 1948)

Galanthus nivalis L.: On Trautfetter Hill, little; how wild (Maluschytska, 1948); sporadically throughout the territory (Berezkina et al., 2007); in the experimental part of Botanical Garden, several small loci with a total area of up to 100 m² (Peregrym, Chekalin, 2014). – Note. *Probably, in all habitats this species was planted.*

Galanthus plicatus M.Bieb.: On both sides of the slopes of the Main Alley, as wild (Maluschytska, 1948); in the experimental part, several loci with a total area of up to 100 m² (Peregrym, Chekalin, 2014)

Galium semiamictum Klokov: At the alpine garden; as wild, but apparently planted!!

Hemerocallis fulva (L.) L.: At the bottom of a large ravine, a small group, listed with plant remains !!

Heracleum stevenii Manden.: Artificial population; spontaneous self-seeding plants are formed annually, but do not spread outside the site!!

Hieracium bifidum aggr.: Spreads around the planting site in the coniferetum !. - Note. The plant needs to be monitored in subsequent years and a more precise definition is desirable, but the general nature of plant pubescence indicates that they belong to the *H. bifidum* group, and not to native plants from *H. murorum* group common near Kyiv.

Isatis tinctoria L.: In the experimental part, self-seed is observed (inaturalist.org/observations/79513273)

Koeleruteria paniculata Laxm.: Self-seed is observed (Mosyakin, Yavorska, 2001)

Leopoldia tenuiflora (Tausch) Heldr.: On the lawn near the cactus orangery; as wild, but has no tendency to spread (Maluschytska, 1948)

Leucanthemum ircutianum (Turcz.) DC.: On the rock garden and around it, 9.06.2021!!

Leymus racemosus (Lam.) Tzvelev (sub *L. sabulosus* (M.Bieb.) Tzvelev): On the lawn near the main orangery, how wild (Maluschytska, 1948)

Limonium gerberi Soldano: On the slopes of the terrace near the main orangery, how wild (Maluschytska, 1948)

Macleaya cordata (Willd.) R.Br.: In the site of medicinal plants, how wild, 24.08.2007, leg. L. Gubar (in herbarium KW: № 072526), quoted for (Orlov, Gubar, 2009); there, actively distributed (Orlov, Gubar, 2009). – Note. We noted a colony of *M. cordata* of vegetative origin, which is only a few meters wider than the original planting site; expansion of this plant is absent.

Menispermum dauricum DC.: Self-seed is observed, 9.06.2021!!

Mentha suaveolens Ehrh.: In the site of medicinal plants, occasionally; on the site of the exposition of the arboretum, sporadically (Konaikova et al., 2015)

Metasequoia glyptostroboides H.H.Hu & W.C.Cheng: self-seeding plants around adult trees, mostly in the shade in damp cracks!! (Fig. 8) (inaturalist.org/observations/95881185)

Miscanthus sinensis Andersson: In the wasteland, how wild?, 2000 (Mosyakin, Yavorska, 2001)

Nicandra physalodes (L.) Gaertn.: Alone near the beds, along paths – in the northeastern part of the Botanical Garden, and near the greenhouse, how wild (Maluschytska, 1948); !! (www.inaturalist.org/observations/98684475)

Ornithogalum nutans L.: In the northeastern part of the Botanical Garden, on the lawn, a little; as wild, but has no tendency to spread (Maluschytska, 1948)

Parthenocissus tricuspidata (Siebold & Zucc.) Planch.: Rarely, between the bushes in the area of rhododendrons and relict plants (Berezkina et al., 2007)

Paulownia tomentosa (Thunb.) Steud.: Around the orangery, a spontaneous young generation near the adult trees!! (Fig. 9) (inaturalist.org/observations/95881178)

Petrorhagia prolifera (L.) P. W. Ball & Heywood: Self-seed is observed, 14.07.2021, leg. V.P. Kolomiychuk!!; ibid (inaturalist.org/observations/90627382)

Phalaris arundinacea L.: In the wasteland near the collection plantations, sub cv. 'Variegata' (Mosyakin, Yavorska, 2001)
Primula vulgaris Huds.: On the lawn under the bushes in front of the main orangery; as wild, but has no tendency to spread (Maluschytska, 1948)
Pseudofumaria lutea (L.) Borkh.: In the site of ornamental plants, alone (Konaikova et al., 2015)
Puschkinia scilloides Adams: In the beds near the main orangery and near the cactus orangery, alone; as wild, but has no tendency to spread (Maluschytska, 1948)
Quercus castaneifolia C.A.Mey.: At the bottom of a large ravine, a few seedlings; apparently acorns with garbage brought!!
Reynoutria japonica Houtt.: On the lawn south of the main orangery, how wild, sub *Polygonum sieboldii* de Vriese (Maluschytska, 1948); Alone, near the orangery (Berezkina et al., 2007)
Reynoutria sachalinensis (F.Schmidt) Nakai: On paths and on the lawn south of the main orangery, how wild (Maluschytska, 1948)
Rhus typhina L.: Near the orangery with succulents, alone; adventive plant (Konaikova et al., 2015)
Rudbeckia hirta L.: Self-seed is observed!!
Ruta graveolens L.: Self-seed is observed !!
Sedum hispanicum L.: Self-seed is observed, 1.06.2021, leg. V.P. Kolomiychuk (inaturalist.org/observations/81166237)
Sorbaria sorbifolia (L.) A.Braun: Sporadically, in areas along the fence on the side of T. Shevchenko Boulevard (Berezkina et al., 2007)
Toxicodendron radicans (L.) Kuntze: Has abundant vegetative renewal, clogs the plantings (Kolishnichenko, 2005).
Tulipa sylvestris L. subsp. *australis* (Link) Pamp. (= *T. quercetorum* Klokov & Zoz): in the north-east part of the Botanical Garden, in the clearings; as wild, but has no tendency to spread (Maluschytska, 1948); sporadically, in the experimental part on the slopes and between the bushes (Berezkina et al., 2007); on the ground floor of the experimental part of the Botanical Garden, the area around 350 m² (Peregrym, Chekalin, 2014). – Note. Probably, the tulip reproduces in the places where it was planted.
Vigna radiata (L.) R.Wilczek: At the bottom of a large ravine, on plant remains!!
Vitis labrusca L.: Near the coniferetum, 1 individual on the side of the path; ergasilipophyte!!
Vitis vinifera L.: Near the coniferetum; ergasilipophyte!!

Appendix 3. Additional checklist of unconfirmed taxa

Allium giganteum: It may have been indicated instead of *A. altissimum* (see note in Appendix 1 to the last species)
Calamagrostis canescens (Weber) Roth: On lawns, on the paths of the "System" site, occasionally (Konaikova et al., 2015). – Note. Presumably, this taxon is given instead of *C. epigejos*.
Crepis pannonica (Jacq.) C.Koch: In the site of ornamental plants, alone (Konaikova et al., 2015)
Cynodon dactylon (L.) Pers.: Near paths everywhere in the Botanical Garden, how wild (Maluschytska, 1948). – Note. Probably given instead of *Digitaria sanguinalis*.
Gagea pratensis (Pers.) Dumort.: In 4 different places of the Botanical Garden (Peregrym, Chekalin, 2014). – Note. It is possible that these plants belong to the native species *G. transversalis*.
Polygonum arenarium Waldst. & Kit.: Sporadically, throughout the territory (Berezkina et al., 2007). – Note. Probably indicated instead of *P. aviculare* subsp. *neglectum*.
Verbascum thapsus L.: On the lawn, alone (Konaikova et al., 2015). – Nota. Probably mentioned instead of *V. phlomoides*.
Veronica hederifolia L.: (Maluschytska, 1948; Konaikova et al., 2015). – Note. Indicated instead of *V. sublobata*.



Fig. 2. *Allium altissimum*



Fig. 3. *Apocynum cannabinum*



Fig. 4. *Coreopsis grandiflora*



Fig. 5. *Erechites hieraciifolius*



Fig. 6. *Lactuca sibirica*

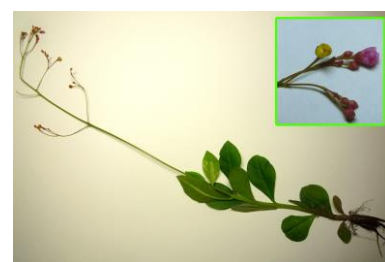


Fig. 7. *Talinum paniculatum*



Fig. 8. *Phytolacca americana*



Fig. 9. *Paulownia tomentosa*



Fig. 10. *Metasequoia glyptostroboides*