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Catalogue of alien plants of the Czech Republic (3rd edition): species richness, status, distributions, habitats, regional invasion levels, introduction pathways and impacts

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Abstract: We present the third edition of the complete catalogue of the alien flora of the Czech Republic, which follows the 2002 and 2012 editions. It has been updated by incorporating new data collected over the last decade and reassessing the current status of taxa based on improved taxonomic and ecological knowledge. All changes in the taxon listing from the 2012 version are documented and explained in an appendix. Based on comprehensive data sources, including the recently developed Pladias Database of the Czech Flora and Vegetation and the Archaeobotanical Database of the Czech Republic, we list 1576 taxa alien to this country, with information on their taxonomic position, life form, geographic origin, residence time category (archaeophyte or neophyte), invasion status (casual, naturalized or invasive), date of the first and last field record, grid-cell occupancy, pathway of introduction into the country, habitat affiliation and impact assessment. This edition includes 122 more taxa than the 2012 edition; 157 taxa were added and 35 were removed. Of the removed taxa, 17 were reclassified as native, eight were removed due to lack of evidence of the occurrence in the wild, records of six taxa were assessed as doubtful, and four are not taxonomically justified. The alien flora is recruited from 630 genera and 122 families, and comprises 385 archaeophytes and 1191 neophytes; most taxa are casual (1084, i.e. 68.8% of the total number), 417 taxa are naturalized (26.4%), and 75 are invasive (4.8%). The proportion of invasive taxa is almost equal for archaeophytes and neophytes (4.7% and 4.8%, respectively), casual taxa are over-represented among neophytes, and naturalized taxa among archaeophytes. The contribution of alien taxa to the Czech flora is 37.8% if all aliens are considered or 16.2% if only naturalized taxa (including invasives), which are a permanent part of the

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flora, are included. For all groups of invasion status, the numbers of taxa are increasing over time with no sign of deceleration. Most alien plants originate from the Mediterranean region (618 taxa, i.e. 31.5%), other parts of Europe (380 taxa, 19.4%), other parts of Asia (290 taxa, 14.1%) and North America (262 taxa, 13.4%). The highest number of invasive taxa (27, corresponding to 27.6% of all invasive archaeophytes and neophytes) are from North America. Occupancy of grid cells of 10 × 6 arc-minutes significantly increases with invasion status and residence time. Invasive taxa are present in more grid cells than naturalized and casual, and archaeophytes occupy on average more grid cells than neophytes in each invasion status category. Maps based on the cumulative record of alien species occurrence over the past 50 years, expressed as the proportion of the entire flora, show that alien species are relatively more prevalent in lowlands and large urban agglomerations. In a European comparison, the Czech Republic is currently a moderately invaded country.

Keywords: alien flora, casual, checklist, Czech Republic, EICAT, geographic origin, grid-cell occupancy, habitat, impact, introduction pathways, invasive plants, naturalized, non-native species, residence time, taxonomy

Introduction

Progress in knowledge on alien plant distributions and global state of the art

The availability and accessibility of global data on alien organisms and their distribution have greatly improved over the last decade, in line with the rapid increase in knowledge of biodiversity patterns (Feng et al. 2022). Comprehensive databases are now available on naturalized or invasive alien species, not only vascular plants (van Kleunen et al. 2015, 2019, Pyšek et al. 2017b) but also bryophytes (Essl et al. 2015), invertebrates (Capinha et al. 2015, Dawson et al. 2017) and vertebrates (Long 2003, Kraus 2009, 2015, Dyer et al. 2017a, b, Tedesco et al. 2017). Global hotspots of naturalized alien species have been identified across taxa (Dawson et al. 2017). Comprehensive accounts are available for many alien taxa at continental, regional, or national scales (Pyšek et al. 2020b). Database developments and associated analyses of ecological patterns and impacts of alien species have been fuelled by extensive international collaborations, rapid technological advances and extensive data sharing. The IUCN SSC Invasive Species Specialist Group maintains two global databases: the Global Invasive Species Database (http://www.iucngisd.org), which contains profiles of key invasive alien species, and the Global Register of Introduced and Invasive Alien Species (https://www.griis.org, Pagad et al. 2018), which was developed with a mandate of the Convention on Biological Diversity (CBD) and collates data on alien species in all taxonomic groups for all countries (Pagad et al. 2015, 2018). Detailed assessments of global invasion patterns are also available for selected groups of plants, e.g. trees and shrubs (Rejmánek & Richardson 2013, Oswalt et al. 2015), grasses (Canavan et al. 2019), cacti (Novoa et al. 2015), ferns (Jones et al. 2019). Overall, knowledge of plant distributions world-wide has increased in recent years thanks to international efforts to mobilize and collate species occurrence records (GBIF 2022).

Thanks to these efforts, we now have a good knowledge of the numbers of naturalized and, to a lesser extent, invasive alien plants in various regions and estimates of their numbers globally. The most recent figures, derived from the GloNAF database, report ~14,000 vascular plant species with naturalized alien populations in at least one region of the world, representing ~4% of the world's flora (van Kleunen et al. 2015). North America and Europe have accumulated the greatest numbers of naturalized alien species, Northern Hemisphere continents have been the major donors of naturalized plants to other continents, and biomes in the New World and in temperate and Mediterranean-type climates are generally more invaded than those in arid and warm climates (van Kleunen et al. 2015, 2019, Pyšek et al. 2017b). Estimates of the total number of invasive alien plant species suggest that ~2,500 species have reached this status (Pagad et al. 2015), which agrees well with the most recent estimate of 2981 invasive taxa based on a comprehensive review of the literature (Laginhas & Bradley 2022).

This improvement of our knowledge of the distributions of alien plants is important because many of the current theories of the distribution of invasive plant species, as well as causes and consequences of plant invasions are based on macroecological analyses of regional floras (e.g. Cadotte et al. 2006, Lambdon et al. 2008, Blackburn et al. 2009, Capinha et al. 2015, Pyšek et al. 2017b, 2019a, Essl et al. 2019, Guo et al. 2021). The new data, such as those in the GloNAF database, have been used to test some of the central hypotheses of invasion biology by relating the distributions of naturalized species to species traits (Dellinger et al. 2016, Razanajatovo et al. 2016, 2019), exploring the links between abundance, range size, and habitat breadth of naturalized aliens (Fristoe et al. 2021), or modelling the risks of future invasions in the context of climate change (Dullinger et al. 2017, Klonner et al. 2017, Haeuser et al. 2018) and the economic status of world's nations (Seebens et al. 2015). GloNAF has also been used to demonstrate the effects on the naturalization success of mating systems (Dellinger et al. 2016, Razanajatovo et al. 2016, 2019), phylogenetic position of plant families (Lenzner et al. 2021), adaptive strategies (Guo et al. 2018), mycorrhizal associations (Delavaux et al. 2019, Pyšek et al. 2019b), and soil seed banks (Gioria et al. 2021). Other analyses provided new perspectives on the role of introduction history (Kinlock et al. 2022), including colonization by past empires (Lenzner et al. 2022), in plant invasions and their effects on the homogenization of global biodiversity (Yang et al. 2021).

This progress, supported by global and other large databases, is fundamentally dependent on regional checklists that are the results of botanical fieldwork and taxonomic expertise (see Pyšek et al. 2013 and references therein). In this regard, there are still large gaps in data availability, and the quality of information varies by region (van Kleunen et al. 2015). This was one of the reasons why a new series was recently launched in the journal Biological Invasions, aimed at collecting papers that provide information on the alien floras or faunas in large regions, with a focus on providing complete regional data and making such information publicly available (Pyšek et al. 2018).

The importance of regional checklists and the situation in the Czech Republic

In Europe, comprehensive checklists of alien plants for individual countries began to appear in the 1990s. The first checklists for the UK (Clement & Foster 1994, Ryves et al. 1996, Preston et al. 2002) were soon followed by checklists for the Czech Republic (Pyšek et al. 2002), Austria (Essl & Rabitsch 2002), Germany (Klotz et al. 2002) and Ireland (Reynolds 2002). Currently, some regional information is available for the vast majority of countries in the world (Pyšek et al. 2017b, van Kleunen et al. 2019).

Table 1. Summary of information provided on the alien flora of the Czech Republic in previous editions of the catalogue and associated papers.

	Pyšek et al. 2002 (1st edition)	Pyšek et al. 2012b (2nd edition)	Pyšek et al. 2012a	Pyšek et al. 2017b	this article (3rd edition)
Checklist	with classification of invasion status: casual, naturalized, invasive, postinvasive	with classification of invasion status: casual, naturalized, invasive	accounts on ecology of invasive species (n = 61)	updated accounts on ecology of invasive species (n = 61)	with classification of invasion status: casual, naturalized, invasive
Invasion dynamics		population groups based on their long-term trends in metapopulation dynamics, current state of their populations, and link to the propagule pressure from cultivation			
Origin	continents	continents & Mediterranean			continents & Mediterranean
Taxonomic structure	incl. hybridization analysis	incl. hybridization analysis			
Residence time	year of 1st record (neophytes), period of introduction (archaeophytes)	year of 1st record (neophytes); period of introduction (archaeophytes)			year of 1st record & year of last record (neophytes); period of introduction (archaeophytes)
Life history	annual, biennial, perennial, shrub, tree, fern, (hemi)parasitic	annual, biennial, perennial, shrub, tree			
Life form	Raunkiær scheme				Raunkiær scheme
Species traits	Grime strategies, ploidy levels				
Distribution			maps of the level of neophyte invasions in CR; distribution maps of invasive species	maps of the level of neophyte invasions in CR; distribution maps of invasive species	maps of the level of archaeophyte and neophyte invasions, hot- and coldspots of invasions in CR
Occupancy	categories based on number of localities: common, locally abundant, scattered, rare, single locality, extinct	categories based on number of localities: common, locally abundant, scattered, rare, single locality, vanished			number of grid cells occupied (~6.0 × 5.5 km)
Habitat	human-made/ (semi)natural; occurrence in phytosociological alliances	number of habitats where it occurs (n = 88; Sádlo et al. 2007)	distribution of invasive taxa in habitats (n = 88; Sádlo et al. 2007)	distribution of invasive taxa in habitats (n = 88; Sádlo et al. 2007)	occurrence in broad habitat categories (SynHab, n = 14)
Landscape	traditional agricultural vs modern industrial				
Vegetation		cover in vegetation plots	levels of invasion in phytosociological units (alliances)	number of archaeophyte and neophyte species and their cover in phytosociological alliances	
Pathway	accidental/deliberate, detailed planting purpose for the latter	accidental/deliberate			original classification scheme (see text)
Impacts		based on DAISIE data (Vilà et al. 2009)		GISS scores for invasive species (n = 20), black-listed taxa	EICAT classification for invasive taxa (n = 40)

The first comprehensive Catalogue of alien plants in the Czech Republic, published 20 years ago (Pyšek et al. 2002), included 1348 alien taxa and provided information on their invasion status, residence time, origin, the pathway of introduction, rough information on occupancy based on the number of localities recorded, type of habitat and character of landscape (Table 1). These data were utilized in analyses of plant invasions at the regional scale in this country, particularly on topics related to species invasiveness and habitat invasibility (see Pyšek et al. 2012a for details), and were fed into the EU projects DAISIE (2009) and ALARM (Settele et al. 2005), where they contributed to studies at the continental scale of Europe (e.g. Lambdon et al. 2008), including the production of invasion risk maps (Chytrý et al. 2009a, b, 2012) and the first systematic assessment of invasion impacts (Winter et al. 2009, Vilà et al. 2010).

In the second edition of the Catalogue of alien plants of the Czech Republic (Pyšek et al. 2012b), the number of alien taxa increased to 1454 due to improved knowledge and awakened interest of botanists in the recording of alien plants, probably stimulated by the previous publication, but also due to increased focus of nature managers and the general public on biological invasions. The structure of the information provided was similar to the first edition, with a new aspect being a thorough assessment of invasion dynamics using population groups defined along the framework of Blackburn et al. (2011) and based on long-term trends in the metapopulation dynamics of reported species, the current state of their populations, and the link to propagule pressure from cultivation. This edition also included information on habitat affinities based on the previously developed classification of habitats in this country (n = 88, Sádlo et al. 2007), information on the cover of aliens in plant communities based on phytosociological data, and listed invasive species with recorded impacts (Pyšek et al. 2012b). A related article based on the same dataset provided a summary of invasive species ecology, including their distribution maps and maps of invasion levels in the country (Pyšek et al. 2012a). In another overview of plant invasions in the Czech Republic (Pyšek et al. 2017a), impact scores for selected invasive species based on GISS (Nentwig et al. 2010, Rumlerová et al. 2016), the most important black-listed invasive species (based on Pergl et al. 2016b), and updated invasive species accounts were added (Table 1).

Recently, information on the alien flora of the Czech Republic, accumulated over centuries of botanical research, was critically revised and integrated into the Pladias database (Chytrý et al. 2021). The database contains various characteristics of vascular plant species, including their invasion characteristics in the country, based on information from the previous catalogue (Pyšek et al. 2012b).

Aims of the article

This article presents the new edition of the national catalogue of alien plants and updates the previous checklists of alien taxa in the Czech Republic (Pyšek et al. 2002, 2012b) by incorporating new data accumulated over the last decade, updating the status of taxa based on improved taxonomic, phytogeographic and ecological knowledge, and providing a more detailed assessment of their residence times. New aspects not included in the previous catalogues are a detailed assessment of the pathways of introduction for listed taxa, using a newly developed classification scheme, and an evaluation of the impacts of taxa classified as invasive; the latter was done using the EICAT system (Blackburn et al.

2014, Hawkins et al. 2015), an official IUCN tool for classifying the impacts of alien species (IUCN 2020). All changes in the listing compared to the 2012 version are documented in Appendix 1 so that the reasoning behind them can be followed.

Materials and methods

Study area

The Czech Republic, a central-European country with an area of 78,864 km^2, a population of 10.5 million (as of 30 September 2022, https://www.czso.cz/csu/czso/population), thus a population density of 131 inhabitants per km^2, has a long history of botanical research, including detailed floristic recording, taxonomic studies, vegetation surveys and various types of ecological studies (see Danihelka et al. 2017a for a historical overview). The country is prone to invasions due to historical and geographical factors; its location in the centre of the continent provides a number of natural and human-created migration routes opening opportunities for colonization (Pyšek & Prach 2003). In addition, the naturally diverse and heterogeneous landscape mosaic has been complemented by long-lasting human influence (Chytrý 2017). These features, together with a strong botanical tradition and the resulting detailed knowledge of flora and plant communities (Chytrý 2007, 2009, 2011, 2013, Chytrý et al. 2017), make the country a suitable model for studying regional patterns of invasions.

For mapping purposes, the Czech Republic uses the system widely used in central-European phytogeography (Ehrendorfer & Hamann 1965, Schönfelder 1999), which is based on a grid of 10' (arc-minutes, longitude) × 6' (latitude), which is ~12.0 × 11.1 km or 133.2 km^2 at 50° N (further referred to as “grid cells”). The total number of such grid cells in the country, including partial cells, is 679 (Slavík 1998). In addition, there are 2,551 quadrants (quarters of the basic grid cells, further referred to as “grid-cell quadrants”), of which 2,181 lie entirely within the borders of the country (Wild et al. 2019). Unless stated otherwise, the occupancies of grid cells and grid-cell quadrants are based on cumulative data with no temporal restriction, and once a species is reported from a grid cell or quadrant, it is considered present in maps and analyses based on occupancy.

Data sources used to update the checklist

Both earlier editions of the Catalogue of alien plants of the Czech Republic (Pyšek et al. 2002, 2012b) were the basis for the present checklist. For historical data, the compilation of both the previous and current checklist relied on an outstanding tradition of floristic research in the Czech Republic dating back to the late 18th century (reviewed in detail in Pyšek et al. 2002). Several floras and species lists covering the present territory of the Czech Republic and recognizing plants by geographic origin were published already in the 19th century (see Krahulec 2012, Danihelka et al. 2017a for reviews of the history of botanical research). These historical sources provide valuable information on the occurrence of plants at those times and the residence times of neophytes (Pohl 1809, 1814, Presl & Presl 1819, Opiz 1823, 1852, Rohrer & Mayer 1835, Oborny 1886, Formánek 1887, 1897). A wealth of information on alien plants can be found especially in the remarkable works by Čelakovský (1868–1883, 1882–1894), who recognized the alien status and origin of some plants occurring in the Czech flora and commented on their distribution in great detail. The recognition of alien plants continued in floras and specialized studies in the 20th century (e.g. Laus 1908, Domin 1917, 1918, 1919, Dostál et al. 1948–1950, 1954, 1958, 1989). Since the 1960s, increased attention has been paid to plants (including aliens) occurring in human-made habitats (ports, railways, oilseed or wool processing factories, grain silos, mills, rubbish tips, arable land, etc.), thanks to a specialized research section established at the Institute of Botany of the Czechoslovak Academy of Sciences, Průhonice, in 1964. This work yielded several focused compendia (e.g. Hejný et al. 1973) and provided a basis for the systematic recording of alien plants (e.g. Jehlík 1986, 1998, 2013).

The basic sources of information for this catalogue of alien plants were the Flora of the Czech Republic, with eight of nine planned volumes published so far (Hejný & Slavík 1988–1992, Slavík 1995, 1997c, 2000, Slavík & Štěpánková 2004, Štěpánková 2010) and the 9th volume in print (Štěpánková et al. 2023), and the second edition of the Key to the Flora of the Czech Republic (Kaplan et al. 2019). In addition, over the past two decades, new records for the flora of the Czech Republic have been systematically published in an annual series, Additamenta ad floram Reipublicae Bohemicae, which has so far yielded 20 papers (Hadinec et al. 2002, 2003, 2004, 2005, Hadinec & Lustyk 2006, 2007, 2008, 2009, 2011, 2012, 2013, 2014, 2015, 2016, 2017, Lustyk & Doležal 2018, 2019, 2020, 2021, 2022). The series has proved to be a valuable resource, not only reporting new finds but also critically reassessing the status of certain species and providing additional data on their distribution. However, new records of alien plants in this country's flora were also being published elsewhere (e.g. Dřevojan & Letz 2016, Ducháček & Chrtek 2017, Danihelka et al. 2020a).

As part of the activities of the Centre of Excellence Pladias (Plant Diversity Analysis and Synthesis, https://www.pladias.cz), funded by the Czech Science Foundation in 2014–2018, the Pladias botanical database was developed, integrating datasets from several single-purpose botanical databases. These records have been continuously checked for quality and refined by experts since then, and new records are added from published sources, field surveys and herbarium studies (Wild et al. 2019). The Pladias database, which currently contains ~13.7 million plant records (as of 1 September 2022), serves as a tool for mapping the flora of the Czech Republic. Species distribution maps are published in a series, of which 11 instalments have appeared so far (Kaplan et al. 2015, 2016a, b, 2017a, b, 2018a, b, 2019, 2020, 2021, 2022), containing distribution maps of 903 taxa, of which 64 are archaeophytes and 141 are neophytes. For these taxa, comprehensive information is provided on their former and current distribution. The maps of other species' distributions are in various stages of preparation, and these records have also been used for this edition of the catalogue to add or correct information on the first record of many alien taxa in this country. The Pladias database was developed with the long-term vision of maintaining a permanent data infrastructure for botanical surveys and research on the national scale and making it available to the public on the internet (Chytrý et al. 2021). The present checklist will be fully integrated into the Pladias database (https://www.pladias.cz).

Other data sources included unpublished information provided by many colleagues (see Acknowledgments), herbarium collections to verify some literature reports (namely PR, PRC, BRNU and PRA; codes follow NYBG 2022), and our field records since 2012.

Taxonomic assignment of taxa to families follows the APG III classification of the Angiosperm Phylogeny Group (Stevens 2001 onwards, Angiosperm Phylogeny Group 2009), and Smith et al. (2006) for ferns.

Invasion status: casual, naturalized and invasive

We present a checklist of **alien taxa** (synonyms: adventive, exotic, introduced, non-indigenous, non-native) in the Czech Republic, defined as species that occur in the country as a result of human actions that enabled them to overcome fundamental biogeographical barriers (i.e. human-mediated dispersal outside the natural range); they occur in the area as a result of intentional or accidental introduction by humans or spontaneous spread from other countries where they were introduced by humans. Hybrids of a native and alien taxon or hybrids of two alien taxa are considered alien (Pyšek et al. 2004a, 2012b). The opposite, **native taxa** (synonym: indigenous, autochthonous), are defined as those that evolved in a particular area or arrived there naturally by dispersal without human intervention from an area where they are native (Pyšek et al. 2004a, Essl et al. 2018). We classified taxa according to the stage they reached along the introduction–naturalization–invasion continuum (INIC), which describes how species proceed in the invasion process by overcoming geographical, environmental, and biotic barriers (Richardson et al. 2000, 2011, Richardson & Pyšek 2006, Blackburn et al. 2011). Based on this concept, we use the following terms to describe the invasion status of plants occurring in the wild in the Czech Republic: (i) **Casual taxa** do not form self-sustaining populations in the invaded area; they may flourish and occasionally reproduce in an area, but their persistence depends on repeated introductions of propagules. (ii) **Naturalized taxa** (synonym: established) form self-sustaining populations over several life cycles without direct support from people or despite human intervention aimed at controlling them; they often recruit offspring freely, usually close to adult plants, and their persistence does not depend on ongoing input of propagules. (iii) **Invasive taxa** are a subset of naturalized ones; they form self-replacing populations over many life cycles, produce reproductive offspring, often in very large numbers and at considerable distances from the parent plant or site of introduction, and have the potential to spread over long distances; in this concept, impact is not considered for classifying a taxon as invasive (Richardson et al. 2000, Blackburn et al. 2011). Throughout the whole paper, unless otherwise noted, the term "naturalized" refers to naturalized non-invasive taxa (as opposed to invasive taxa, which are a subgroup of naturalized ones, i.e. naturalized invasive taxa).

Assessing the regional flora of a well-studied country has the advantage of consistent and robust classification of invasion status. In invasion studies, the criterion for classifying a species as naturalized, i.e. the fact that it reproduces in the wild and forms self-sustaining populations, is easier to apply than labelling it as invasive. The criterion for naturalization is more or less binary, i.e. the species is either naturalized or not, but the criteria for classifying a species as invasive differ even between ecologists on the one hand and conservationists, managers, and policy makers on the other (CBD 2000, IUCN 2000, see discussion in Pyšek et al. 2017b). Ecological criteria for invasiveness, based on the rate of spread, are quantitative and represent a continuum (Richardson & Pyšek 2006), and this characteristic is extremely difficult to measure (Pyšek & Hulme 2005). Still, after 20 years of assessing the status by the same core group of authors, we believe that the invasion status classification is in good agreement with the definitions presented in the literature (Richardson et al. 2000, 2011, Pyšek et al. 2004a, Blackburn et al. 2011).

Residence-time categories: archaeophytes and neophytes

Assignment of residence-time categories (i.e. archaeophytes introduced before the year 1500 vs neophytes introduced after that date; Holub & Jirásek 1967, Pyšek et al. 2004a) and more detailed periodization (Table 2) was based on archaeobotanical data covering the period of up to the year ~1800 (Archaeobotanical Database of the Czech Republic, Institute of Archaeology CAS 2017, further referred to as CZAD; Dreslerová & Pokorná 2015) and floristic records (Pladias database, herbaria and literature) since ~1800. The CZAD (https://web.arup.cas.cz/czad) was supplemented by some data that are not publicly available. The detailed periodization is available for > 80% of the taxa on the list. Thus, the residence time of the remaining taxa (< 20%) was only broadly estimated based on the combined information. We connected literature sources, such as pictures documenting cultivation (e.g. *Paeonia officinalis* classified as ar/neo), utility indicating intentional introductions (very few records between 1200–1800 refer to unintentionally introduced alien plants), knowledge of ecology, cultural history, biogeography (e.g. North-American and other overseas origins automatically point to the neophyte status), and analogies among similar taxa, e.g. *Adonis flammea* was assigned ar* status based on an ecological analogy with *A. aestivalis* classified as ar BR (immigration in the Bronze Age; Table 2), and *Caucalis platycarpos* subsp. *platycarpos* classified as ar EM (immigration in the Early Middle Ages). The group labelled as ar/neo includes taxa that were intentionally introduced and escaped from cultivation during Middle Ages and Early Modern Period (1200–1800). In the broad binary classification, taxa from the ar/neo group are considered archaeophytes. More details on the use of archaeobotanical identifications of plants' macroremains to determine residence times are provided by Pokorná et al. (2018).

Table 2. Numbers of taxa among the extant alien flora of the Czech Republic that were introduced during each period, with a representation of the overlap between periods due to the coexistence of archaeological cultures on the territory; ar – archaeophyte, neo – neophyte. Species for which the precise dating is not available (i.e. ar*, ar/neo and neo*) are shown in the bottom part of the table. The approximate immigration rate is expressed as the number of species per century. Note that the term Late Middle Ages also corresponds to the term High Middle Ages commonly used in the Czech archaeology.

Code	ar NE	ar ENE	ar BR	ar IR	ar RMP	ar EM	ar LM	neo 1	neo 2	neo 3	neo 4
Period	Neolithic	Eneolithic (Chalcolithic)	Bronze Age	Iron Age	Roman and Migration Periods	Early Middle Ages	Late Middle Ages	Early Modern Period	Late Modern Period	Recent Past	Present
Evidence	archaeobotanical							archaeo-botanical & floristic	floristic (precise dating)		
Time span	5600–4200 BCE	~4500–2300 BCE	2300–~750 BCE	800–~20 BCE	~35 BCE–~580 CE	~550–1200 CE	1200–1500 CE	1500–1800 CE	1800–1950	1950–2000	2000–2022
Duration	1400 yrs	2200 yrs	1550 yrs	~800 yrs	~650 yrs	~650 yrs	300 yrs	300 yrs	200 yrs	50 yrs	22 yrs
Immig. rate	2.4	0.3	3.3	2.0	0.3	8.6	10.0	12.0	263.0	746.0	913.6
No. of taxa	34	7	51	16	2	56	30	36	526	373	201

Code	ar*	ar/neo	neo*
Period	Prehistoric Period and Early Middle Ages (merged)	Late Middle Ages and Early Modern Period (merged)	Late Modern Period & Recent Past & Present (merged)
Evidence	combined data (absence of precise dating)		
Time span	5600 BCE–1200 CE	1200–1800 CE	1800–2022 CE
Duration	6800 yrs	600 yrs	> 200 yrs
No. of taxa	86	103	55

Species characteristics

Taxa were classified according to their geographic origin (native range) at the level of continents, considering the following regions: parts of Europe other than the Czech Republic; Africa; Asia; North America, including Mexico; Central America; South America; and Australia. As in the previous edition, the Mediterranean region, covering parts of southern Europe, northern Africa and western Asia from Turkey and Israel to Afghanistan, was considered a separate region of origin (Meusel et al. 1965; see Pyšek et al. 2012b for a detailed justification). Taxon assignments to Europe, Asia or Africa in Appendix 2 refer to their parts outside the Mediterranean region in this delimitation. Hybrids and species that originated through recent hybridization are listed as a special origin category. The classification of origins also takes into account the fact that some taxa have evolved under human influence rather than under natural conditions, so they have no native distribution range, and their natural habitat is unknown (Kühn & Klotz 2003). For many aliens, native ranges are unknown or highly uncertain, and some are regarded as alien throughout their entire global range. These taxa, termed anecophytes (homeless plants; Zohary 1962), could be plants that originated in cultivation and escaped into the wild or plants that evolved under human land uses, such as agriculture (Kühn & Klotz 2002, 2003, Kühn et al. 2004). The information on geographical origin was taken from the Pladias database, supplemented by literature sources (Essl & Rabitsch 2002, Klotz et al. 2002, Verloove 2006, Medvecká et al. 2012, Pyšek et al. 2012b, Expósito et al. 2018) and databases (https://powo.science.kew.org, https://plants.usda.gov/, https://botany.cz/cs, https://alienplantsbelgium.myspecies.info, https://www.cabi.org, https://www.missouribotanicalgarden.org, https://www.gbif.org).

Our classification of plant life forms follows the system of Raunkiær (1934), which is based on the position of buds that survive the unfavourable season, distinguishing the following categories: therophytes (summer- or winter-annual herbs); hydrophytes (plants with surviving buds in water); geophytes (perennial plants with surviving buds belowground, usually bulbs, tubers or rhizomes); hemicryptophytes (perennial or biennial herbs with surviving buds on shoots at the ground level); chamaephytes (herbs or low woody plants with surviving buds up to 0.3 m above the ground, often cushion plants or dwarf shrubs); nanophanerophytes (woody plants, usually shrubs with buds at 0.3–2 m above the ground); macrophanerophytes (woody plants, usually trees, with buds located above 2 m; see Chytrý et al. 2021 for a more detailed description of life forms and their distribution in the Czech flora). Life form data were taken from the Pladias database.

Pathways of introduction and initial spread

We extended traditional approaches of pathway classification that usually consider the mode of the first introduction to a new region (e.g. Hulme et al. 2008, Pergl et al. 2017, Saul et al. 2017). Here, we focused on a broader time period than the initial introduction event which is often insufficient to capture the way of further species spread and ignores some aspects of cultural ecology; for example, many crops native to the New World were initially grown only in botanical collections (Daunay et al. 2007). The vectors responsible for the introduction and initial spread in the Czech Republic were divided into two basic introduction modes as follows:

(i) Intentional introduction: 1 INT ornamental – cultivation for ornamental purposes in a garden or public green space; 2 INT collection – cultivation for scientific or collection purposes in a garden or park; 3 INT nature – ornamental planting in natural habitats, including deceptive enrichment of regional flora or inclusion of alien plants in seed mixtures sold as "wild meadows"; 4 INT crops – cultivation of crops such as fruits, vegetables, cereals, spices; 5 INT forest – forestry and wildlife management, e.g. planting trees in forestry plantations or cultivation of crops in forests as fodder for the game; 6 INT land – landscaping, e.g. afforestation, land reclamation, roadside tree belts, tree alleys; 7 INT other – cultivation for other purposes, e.g. forage crops, plants for basketry, beekeeping and pharmacy.

(ii) Unintentional introduction: 8 UNINT agriculture – introduction associated with agriculture: weeds in fields (e.g. cereals, flax), vegetable beds and vineyards; 9 UNINT plantation – introduction associated with fodder crop cultivation, sowing meadows and planting forest trees; 10 UNINT horticulture – introduction associated with the horticultural sale of ornamental plants, i.e. weeds of ornamental gardens; 11 UNINT traffic – dispersal by vehicles, trains, shipping, tourism; 12 UNINT industry – dispersal through mining or production/transport of commodities, e.g. ores, wool; 13 UNINT humans – other unintended vectors associated with anthropogenic habitats; 14 UNINT nature – other unintended vectors associated with natural habitats, e.g. dispersal by wind, water, animals.

Mapping the levels of invasion

We extracted records of plant species occurrence since 1970 from the Pladias database (Wild et al. 2019, Chytrý et al. 2021) and mapped the spatial patterns of selected categories of alien species as a proportion of the total flora of the Czech Republic in grid-cell quadrants of 5' (longitude) × 3' (latitude) (~6.0 × 5.5 km). For each of six categories of alien species (all alien species, archaeophytes, neophytes, casuals, naturalized and invasive species), we mapped (i) the proportion of alien species relative to the entire flora of a grid-cell quadrant, and (ii) alien hotspots/coldspots, i.e. grid-cell quadrants with 10% of highest/lowest proportions. Data were geoprocessed in R v.4.2.1 (R Core Team 2022) using the R packages berryFunctions (Boessenkool 2022), classInt (Bivand et al. 2022a), raster (Hijmans et al. 2022) and rgdal (Bivand et al. 2022b). The colour scale of the maps representing continuous proportions was determined using k-means clustering (MacQueen 1967) and based on combining all values from all species categories so that the scale was comparable among maps. The scale of the maps of hotspots/coldspots of alien species was determined independently for each category to show unique patterns.

Habitats

In the previous edition of the catalogue, we categorized the habitat affinities of alien taxa based on information about their occurrence in 88 major habitat types in the Czech Republic as defined by Sádlo et al. (2007), which is based on phytosociological alliances or groups of alliances (see Pyšek et al. 2012a, b for details). The classification was applied for the taxa on the current list, information was updated, and habitats were assigned to taxa that represent an addition to the previous edition. The data have been integrated in the Pladias database.

Table 3. Classification of broad habitat types of the SynHab project that allow for comparison of habitat affinities with other global datasets (based on Hejda et al. 2015).

Habitat type	Description
1. Forests	closed vegetation dominated by deciduous or evergreen trees
2. Open forests	woodlands with canopy openings created by environmental stress or disturbance, including forest edges
3. Scrub	shrublands maintained by environmental stress (aridity) or disturbance
4. Grasslands	open graminoid-dominated habitats maintained either by climate (steppes, prairies, savannas) or land-use (grazing, mowing) or a combination of both
4a. Natural grasslands	grasslands mantained by climate (aridity, unevenly distributed precipitation), herbivores or environmental stress (aridity, instability or toxicity of substrate)
4b. Human-maintained grasslands	grasslands dependent on regular human-induced management (mowing, grazing by livestock, artificial burning)
5. Sandy	dunes and other habitats on unstable sandy substrate, stressed by low nutrients, drought and disturbed by sand movement
6. Rocky	cliffs and rock outcrops with very shallow or no soil
7. Dryland	habitats in which drought stress limits vegetation development
8. Saline	habitats stressed by high soil salinity
9. Riparian	a mosaic of wetlands, grasslands, tall-forb stands, scrub and open forests in stream corridors
10. Wetland	sites with the permanent or seasonal influence of moisture, ranging from oligotrophic to eutrophic
11. Aquatic	water bodies and streams with submerged and floating plant species
12. Man-made	habitats created by humans or where the human factor is the main shaping force
12a. Ruderal habitats	anthropogenically disturbed or eutrophicated sites, where the anthropogenic disturbance or fertilization is typically a side-product and not the aim of the management
12b. Agricultural habitats	synanthropic habitats directly associated with growing of agricultural products, thus dependent on specific type of management (ploughing, fertilization)

An additional level of habitat classification for naturalized taxa, which we have adopted in the current edition, uses rather broad habitat categories that allow for comparisons among world regions as applied in the ongoing SynHab project (Macroecology of Plant Invasions: Global Synthesis across Habitats; https://www.synhab.com). In this system, coarse categories are used (i) to avoid misinterpretations of narrative information and (ii) to account for habitats in different biomes that may differ in characteristic features but still be classified within the same broad category. The classification is similar to that developed by Hejda et al. (2015), which has been updated to distinguish 14 categories of basic habitat types (Table 3). All of these categories are defined by a dominant factor that shapes the habitat, although this factor differs between categories. For example, the categories "forests", "scrub" or "grasslands" are defined by the life form of the dominant species. In contrast, the categories "dryland" or "saline" are defined by the physical or usually chemical factors that characterize these habitats. The category "riparian" is defined by the specific disturbance regime that creates disturbed sites rich in resources and transports propagules of both native and alien species. We created a matrix of taxa and habitats, with binary (0/1) assignments of taxa to habitat categories. Most taxa are assigned to more than one habitat type. For example, when the scale of occupied habitats is described as "wetlands, wet meadows and riparian scrub", the taxon was assigned to "wetlands", "grasslands", "riparian" and "scrub" categories. For an alien species growing along a road that crosses a natural landscape, it depends on whether it also occurs in the adjacent natural vegetation or is only spreading along the road with traffic. In the latter case, it would be assigned to a single category 12a (human-made, anthropogenic ruderal habitats), but if it also occurred elsewhere in the natural vegetation, it would also be classified according to that vegetation, with possibly multiple categories assigned.

Impact scoring: EICAT

For invasive plants, we assessed environmental impacts using the EICAT scheme (Environmental Impact Classification for Alien Taxa; Blackburn et al. 2014) adopted by IUCN (https://www.iucn.org/resources/conservation-tool/environmental-impact-classification-alien-taxa-eicat). Assessment protocols followed descriptions in Hawkins et al. (2015) and updates by Volery et al. (2020). Information sources were identified by searching published literature and local reports in Google Scholar and Web of Science. Only primary references were used. Publications describing environmental impacts in the native range and laboratory/garden/pot experiments were not included. Impacts identified in the literature were classified by magnitude based on the five EICAT categories: minimal concern (MC), minor (MN), moderate (MO), major (MR) or massive (MV) for each of the 12 mechanisms described in Blackburn et al. (2014). Taxa with no available information for any impact mechanism were classified as data deficient (DD). The highest level of impact assigned to a taxon under any of the mechanisms was considered the outcome of the assessment and analysed in this article.

Statistical analysis

The association between invasion status (casual, naturalized and invasive) and residence time (archaeophyte and neophyte), expressed as the number of taxa, was tested for independence using the chi-square test. The difference between observed and expected values for individual cells in this contingency table was tested by relating the chi-square statistic to the squared size of the observed effect using the pchisq() function.

The relationships among continuous variables were tested and visualized by using linear models (increase of alien taxa over time), generalized linear models with the quasi-binomial distribution (differences in occupied grid cells among different invasion and residence statuses; and the relationship between the number of occupied grid cells and residence time) and generalized linear models with the quasi-Poisson distribution (relationship between the number of alien taxa and residence time). The number of alien taxa, the response variable in linear models, was square-root-transformed to improve the homogeneity of variance and normality. Differences between residence time and invasion status categories were tested using analysis of variance, with origin included as a random factor (as an error term) in the models. The differences among categories of the invasion status were further tested by the post-hoc Tukey HSD pairwise comparison of estimated marginal means (Lenth 2021). Graphs were plotted using the ggplot2 and dplyr packages from the tidyverse collection (Wickham et al. 2019). All computations were performed using the program R 4.2.1 (R Core Team 2022).

Results and discussion

Big picture: the numbers

Based on the update presented in this paper, the alien flora of the Czech Republic includes 1576 taxa and consists of 385 archaeophytes and 1191 neophytes (see Appendix 2 for the complete checklist); the two groups account for 24.4% and 75.6%, respectively. The majority of taxa are casual (1084, i.e. 68.8% of the total number), 417 taxa are naturalized

Table 4. Numbers of all alien taxa in the Czech Republic, cross-tabulated across invasion status and categories of residence time. Note that invasive taxa are a subgroup of naturalized taxa.

	Casual	Naturalized	Invasive	Total
Archaeophytes	157	210	18	385
Neophytes	927	207	57	1191
All aliens	1084	417	75	1576

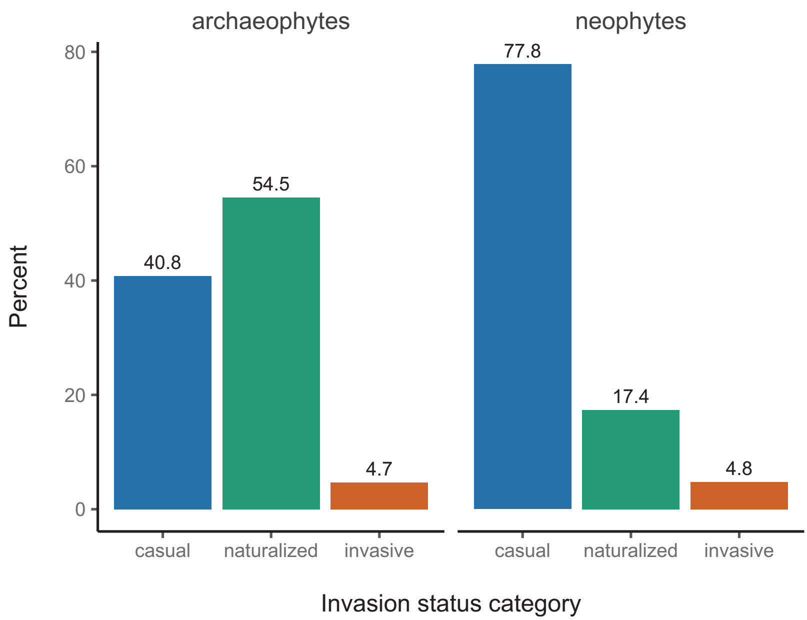


Fig 1. Representation of taxa by invasion status (casual; naturalized; invasive) among archaeophytes and neophytes in the alien flora of the Czech Republic. See Table 4 for the numbers of taxa.

(26.4%), and 75 are invasive (4.8%; Table 4). The proportion of invasive taxa among archaeophytes and neophytes is nearly equal (4.7% and 4.8%, respectively), but there is a marked difference in proportions within the other two categories of invasion status – naturalized non-invasive taxa make up 54.5% of archaeophytes but only 17.4% of neophytes, and the ratio is reversed for casual status, which applies to 77.8% of neophytes and 40.8% of archaeophytes (Fig. 1). Thus, casual taxa are over-represented among neophytes, and naturalized taxa among archaeophytes (Table 4). This is due to the fact that archaeophytes went through the process of naturalization in the past, and what we observe today are taxa that have successfully naturalized, and information on those that failed and only occurred as casuals is not available.

The proportion of naturalized taxa among the total number of aliens is difficult to compare with other regions because most regional checklists do not consider casual taxa in as much detail as our data. Continental and global overviews thus usually focus on naturalized aliens (Lambdon et al. 2008, Pyšek et al. 2017b). Consequently, the numbers of casual taxa, when reported, are often unrealistically low (see Lambdon et al. 2008: Table 1), with only a few exceptions, such as the Catalogue of neophytes in Belgium (Verloove 2006), where 1486 casual taxa make up 76.9% of the total number of neophytes, a figure fairly close to ours.

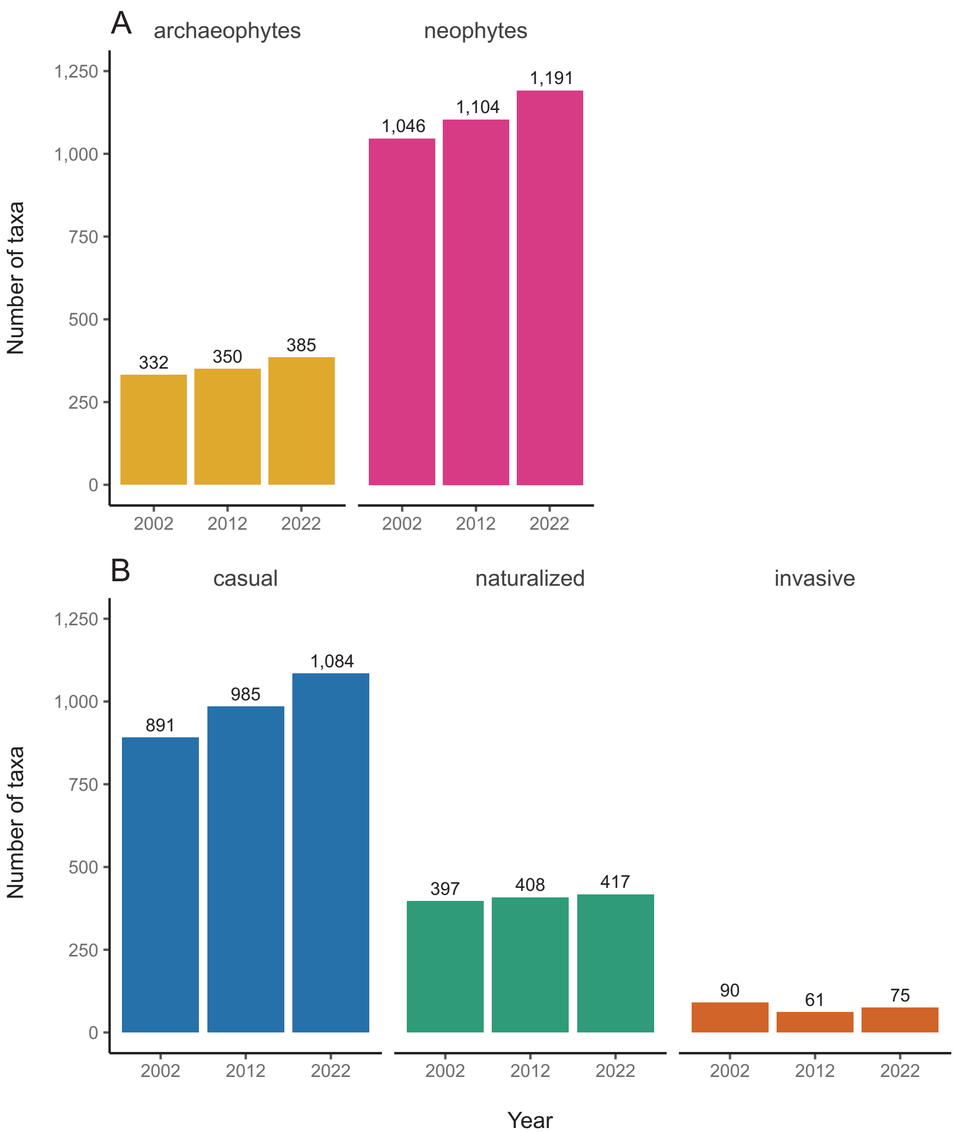


Fig 2. Comparison of changes in the richness of Czech alien flora in the last 20 years as represented in the three editions of this catalogue (Pyšek et al. 2002, 2012b and this article). Bars represent the numbers of taxa.

The 20-year continuity allows us to compare the representation of taxa by invasion status and residence time categories in the three editions of this catalogue. The total number of aliens increased by 76 from 1378 reported in the first edition (Pyšek et al. 2002) to 1454 in the second edition (i.e. by 5.5%) and by additional 122 to 1576 in the current edition (by 8.4% compared to 10 years ago). This represents a steady increase in the total number of alien taxa by 14.4% over two decades (Fig. 2A).

Compared to the previous edition (Pyšek et al. 2012b), the increase by 122 taxa results from 157 taxa newly added and 35 that were removed from the checklist because 16 taxa were reclassified as native, for eight previously included, there is no reliable evidence that they escape from cultivation, the records of six taxa are doubtful, and four taxa are not taxonomically justified (see Appendix 1 for details and justification).

In terms of invasion status, the steady increase is due to higher numbers of both neophytes and archaeophytes. Neophytes were represented by 1046, 1104 and 1191 taxa in the three editions of the catalogue (representing a 13.8% increase over the whole period) and archaeophytes by 332, 350 and 385 taxa, respectively (i.e. 16.0% increase from 2002 to 2022). The increase in these two groups is obvious, in contrast to invasives where no trend is evident (Fig. 2A). The trend in neophytes is due to taxa newly introduced to the Czech Republic, discovered by studying herbaria, or starting to escape from cultivation; the latter mechanism also applies to archaeophytes (see Appendix 1), but in this group, the increase in the number of taxa is largely due to improved knowledge resulting from more systematic archaeobotanical research in the last decade (CZAD, Dreslerová & Pokorná 2015, Pokorná et al. 2018), which resulted in the reclassification of some neophytes as archaeophytes. If taxa are separated by invasion status, it is clear that the increase in the number of aliens is mainly due to casuals, of which there are 21.6% more than in the 2002 edition; naturalized taxa increased to a lesser extent, by 5.0%, and invasive taxa vary (Fig. 2B). The varying numbers of invasive taxa are most likely due to the broader context considered in the evaluation, which now includes long-term experience and observation of trends, allowing for more robust classification and reflecting the changing landscape and climate. The above-mentioned trends are obvious when looking at the relative numbers, with the ratio of archaeophytes and neophytes remaining fairly stable and the proportion of casuals increasing at the expense of naturalized taxa (Table 5).

Table 5. Changes in the proportional representation of invasion status and residence time categories in the Czech alien flora, based on a comparison of previous editions (Pyšek et al. 2002, 2012b) with the current state. The values represent percentages from the total number of alien taxa reported in a given year (1378 in 2002, 1454 in 2012, and 1576 in this study).

		2002	2012	2022
Residence time	Archaeophytes	24.1	24.1	24.4
	Neophytes	75.9	75.9	75.6
Invasion status	Casual	64.7	67.7	68.8
	Naturalized	28.8	28.1	26.4
	Invasive	6.5	4.2	4.8

Of the 1576 alien taxa, there are 1270 species (80.6%), 142 subspecies (9.0%), 25 varieties (1.6%), six cultivars (0.4%) and 18 taxa classified as a group (including one s. lat. and one agg.; 1.1%). There are 115 alien hybrids (7.3%), which represents an increase compared to the previous edition, where 94 hybrids were reported (Pyšek et al. 2012b, see the detailed analysis of hybridization patterns there). The taxonomic ranks must be considered when expressing the contribution of alien flora to the total plant richness of the country. If the rank of species is used, there are 1385 aliens (this number consists of the 1270 taxa classified at the species level and 115 of the 137 subspecies that are the only representatives of a given species), of which 946 are casual, and 439 are naturalized. The native Czech flora includes 2287 species in the Pladias database (https://www.pladias.cz), so the total plant richness at the species level is 3672. Thus, the share of alien species in the Czech flora is 37.7% if all alien species are considered regardless of their status, or 16.2% if only naturalized species are counted, including invasive species, i.e. all species that form the permanent component of the flora. If hybrids are added, the percentage of all aliens is reduced to 34.9% because hybrids are disproportionately more frequent in the native flora than in the alien flora. The percentage of naturalized aliens in the total flora of the country has increased compared to the previous edition (Pyšek et al. 2012b), where the figure of 14.4% was reported. These proportions are difficult to compare with the values reported for European countries, where on average, 15.8% of naturalized alien plants are found in the national or regional floras, or for North America, with the corresponding value of 19.2%. However, data for these continents are based on the GloNAF database, which only considers neophytes because the archaeophyte status of some species is unclear, the classification is not available for all European regions and is not routinely used in other regions of the world (Pyšek et al. 2017b). This suggests that the current level of invasions by naturalized neophytes (8.6%) in the Czech Republic may be relatively low compared to other, more invaded regions with similar cultural environments and climates.

Introduction dynamics

The influx of archaeophytes into the territory of the present Czech Republic began in the Neolithic Period (5600–4200 BCE); there are records of 34 archaeophytes introduced during this 1400 years long period resulting in the immigration rate of 2.4 taxa per century. The following Eneolithic Period (~4500–2300 BCE) meant a slowdown in the immigration rate to 0.3 taxa per century. Introductions continued in the Bronze and Iron Ages at a more or less steady rate of 3.3 and 2.1 taxa per century, respectively. Only two records of new archaeophytes are available for the Roman and Migration Periods (35 BCE to ~580 CE) with an immigration rate of 0.3 taxa per century, which contrasts with the situation in southern and south-western Europe; this is caused by the Czech Republic being located relatively far from the influence of the then Roman Empire. The immigration rate of archaeophytes increased to 8.6 and 10.0 taxa per century in the Medieval Period (~550–1500 CE), followed by the first wave of neophytes introduced between 1500 and 1800 CE, with an immigration rate of 12.0 taxa per century. After 1800, the pace accelerated, with 526 new taxa recorded between 1800 and 1950 and at least 373 taxa in the following 50 years (Table 2). A graphical representation of these dynamics over the whole period of introductions from the Neolithic to the present is shown in Fig. 3.

It is difficult to assess how precisely the observed trend reflects the real situation. There is no doubt about the acceleration of the immigration rate since the Late Modern Period; however, we need to keep in mind that data in different periods are based on different sources (i.e. on archaeobotany in the Prehistoric to Medieval Period, on combined data in 1500–1800 CE, and on floristic observations since ~1800 CE to present), and also that we miss data on taxa that went extinct following introduction without being captured by the archaeobotanical record. Besides, 86 archaeophytes and 55 neophytes (along with 104 utility plants classified as ar/neo) could not be dated more precisely than archaeophytes (ar*) and neophytes (neo*).

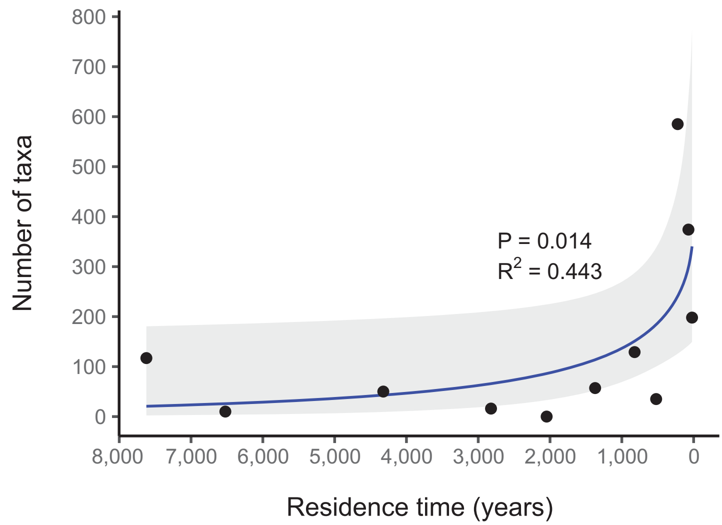


Fig. 3. Relationship between the number of alien taxa currently present in the Czech flora and the time when they were introduced. Based on the categories of residence time described in Methods (see Table 2), with the beginning of the period plotted on the horizontal axis; ar* were merged with ar NEO, ar/neo with ar LM, and neo* with neo 2. The regression line is based on a GLM with the Poisson distribution, df = 10; P = 0.014.

Data on the year of the first record, available for 946 of 1191 neophytes (i.e. 79.4%), are routinely used as a proxy for residence time (Castro et al. 2005, Pyšek & Jarošík 2005, Wilson et al. 2007, Williamson et al. 2009, Seebens et al. 2017) and document the rate of introduction for taxa with different invasion status (Fig. 4A). The number of taxa that remained casual after introduction increased with residence time at the fastest rate; of those that have later successfully naturalized, more than half (52%) arrived by the end of the 19th century, but they are still increasing. Of the taxa now considered invasive, 77% were present in the country more than 120 years ago, by 1900, and 87% by 1950. Yet, the slopes of the increase in the number of taxa with time were significantly different from zero for all groups of invasion status, including invasive taxa, indicating that new invaders will continue to appear in the Czech Republic in the future (Fig. 4A). For all aliens combined, the number of new arrivals increased significantly linearly at 20-year intervals, with no sign of deceleration (Fig. 4B).

Using archaeophytes as a reference group for comparison with neophytes is not straightforward because archaeophytes are not a homogenous group, and their characteristics have even changed gradually over time. Separating arrivals of alien taxa into finer categories of residence time (Table 2) reveals that the characteristics of alien flora differed according to phases of history when they arrived, e.g. due to changing nature of agriculture, changes of intensity of human impact on the landscape etc. This can be illustrated by the changing life-history spectra over time. In early prehistoric times, mainly specialized annual weeds of arable land and cereals invaded (annual herbs made up more than 80% of all alien taxa in the Neolithic). Later on, the share of perennial herbs increased (in the Middle Ages, annuals made up only ~50% of all arrivals, and the share continued to decrease in younger periods). Woody plants became an integral part of new immigrants from the Middle Ages onwards (Fig. 5).

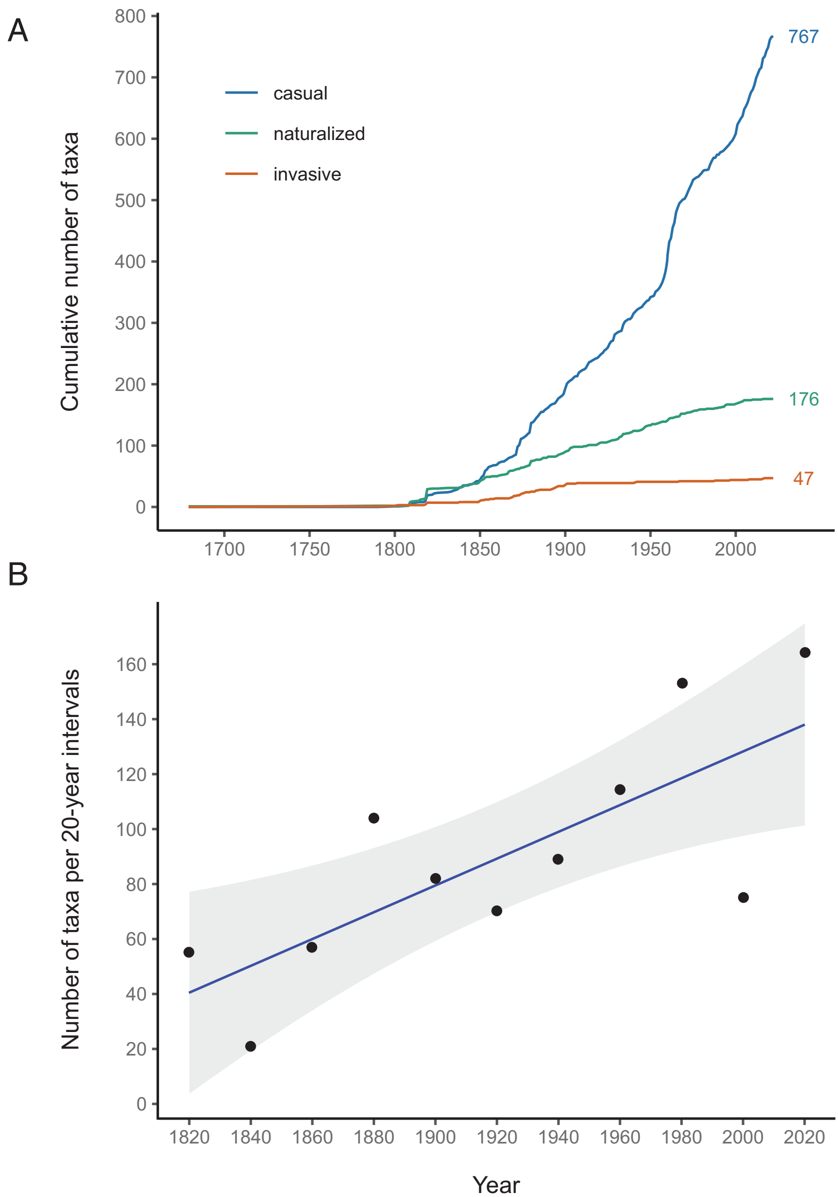


Fig. 4. Increase in the number of alien taxa recorded over time, shown separately for invasion status categories (A) and for all aliens at 20-year intervals (B). Slopes of linear regression in (A) significantly differed from zero for casual ($F = 9696.3$; $df = 1, 200$; $P < 0.001$), naturalized ($F = 3635.9$; $df = 1; 200$, $P < 0.001$) and invasive taxa ($F = 983.49$; $df = 1; 200$, $P < 0.001$). Numbers of taxa for which the date of the first year is known are indicated for particular categories of invasion status. The shaded area represents a 95% confidence interval for the fitted curve.

The finer division of alien taxa into categories according to their minimum residence time reflects the limitations of the data available. The closer we get to the present, the finer periodization is possible. For archaeophytes, we have epochs of various lengths,

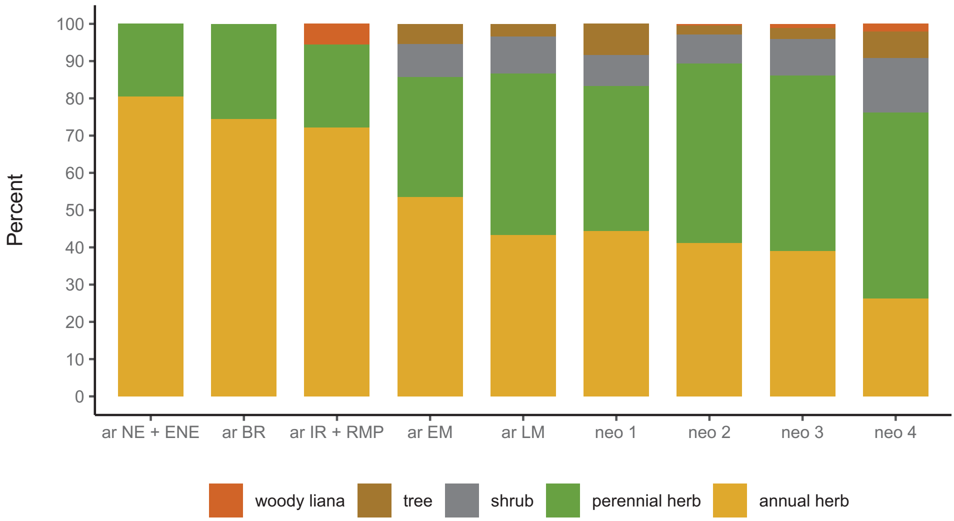


Fig. 5. Representation of growth forms among groups of alien taxa arriving at different periods, based on the categories of residence time outlined in Table 2. Note that some periods were merged because of the low number of taxa in the Eneolithic (ar ENE) and Roman to Migration Period (ar RMP). Information on growth forms was taken from the Pladias database (https://www.pladias.cz).

which are dated archaeologically. Unfortunately, the periods of the past may contain various hiatuses. It is thus important to keep in mind that this is the current state of knowledge, the result of several decades of archaeobotanical data collection, and it can be expected that the data will continue to be refined over time.

Grid-cell occupancy

The most widespread taxa are listed in Table 6, with occupancy expressed at two resolutions. The ranking of invasive taxa indicates that among archaeophytes that are generally more widespread than neophytes (see Fig. 6), those with the highest occupancy occur throughout the Czech Republic: *Arrhenatherum elatius* is reported from 662 grid cells out of the 679 in total (i.e. 97.5%); similarly high values are achieved by another archaeophyte, *Cirsium arvense* (97.2%), and the neophyte *Impatiens parviflora* (94.1%), followed by *Conyza canadensis* (85.4%), *Lactuca serriola* (84.1%) and *Solidago canadensis* (82.2%). The most widespread naturalized species are the archaeophytes *Tanacetum vulgare* (96.2%), *Linaria vulgaris* (94.7%), *Capsella bursa-pastoris* (94.1%) and the neophyte *Epilobium adenocaulon* (94.0%).

Invasive taxa are present in more grid cells than naturalized and casual, and archaeophytes have greater grid-cell occupancy than neophytes in each of the invasion status categories (Fig. 6). The number of grid cells occupied by a taxon decreases with the year of introduction, i.e. it increases with residence time measured as the time since the first record. This relationship is significant for all alien taxa merged, i.e. not only for neophytes but also archaeophytes that were first recorded as escaping from cultivation only recently (Fig. 7A), although they were previously present in cultivation, and for neophytes distinguished by invasion status categories (Fig. 7B). These patterns are consistent with well-established

Table 6. The most widespread invasive and naturalized taxa in the Czech alien flora. The top 20 taxa in each category are listed, with two measures of occupancy, the number of grid cells ~12.0 × 11.1 km in size, and the number of grid-cell quadrants, ~6.0 × 5.5 km (see Methods).

Taxon	Invasion status	Residence time	Grid cells	Quadrants
Arrhenatherum elatius	inv	ar	662	2406
Cirsium arvense	inv	ar	660	2395
Impatiens parviflora	inv	neo	639	2220
Conyza canadensis	inv	neo	580	1616
Lactuca serriola	inv	ar	571	1646
Solidago canadensis	inv	neo	558	1321
Robinia pseudoacacia	inv	neo	553	1645
Bidens frondosa	inv	neo	550	1460
Quercus rubra	inv	neo	547	1348
Echinochloa crus-galli	inv	ar	541	1498
Galinsoga quadriradiata	inv	neo	540	1317
Impatiens glandulifera	inv	neo	531	1274
Lupinus polyphyllus	inv	neo	528	1224
Galinsoga parviflora	inv	neo	525	1268
Symphoricarpos albus	inv	neo	510	1113
Populus ×canadensis	inv	neo	465	1030
Setaria viridis subsp. *viridis*	inv	ar	464	1145
Solidago gigantea	inv	neo	462	938
Digitaria sanguinalis	inv	ar	451	951
Bromus sterilis	inv	ar	450	1082
Tanacetum vulgare	nat	ar	653	2125
Linaria vulgaris	nat	ar	643	2067
Capsella bursa-pastoris	nat	ar	639	2129
Epilobium adenocaulon	nat	neo	638	1978
Tripleurospermum inodorum	nat	ar	634	2110
Veronica arvensis	nat	ar	624	1971
Trifolium hybridum subsp. *hybridum*	nat	ar	619	1852
Matricaria discoidea	nat	neo	618	1825
Silene latifolia subsp. *alba*	nat	ar	616	1807
Thlaspi arvense	nat	ar	616	1890
Lamium purpureum	nat	ar	609	1791
Veronica persica	nat	neo	609	1922
Arctium tomentosum	nat	ar	606	1780
Bromus hordeaceus subsp. *hordeaceus*	nat	ar	600	1673
Senecio vulgaris	nat	ar	593	1486
Geranium pusillum	nat	ar	592	1715
Atriplex patula	nat	ar	590	1644
Convolvulus arvensis	nat	ar	587	1808
Euphorbia helioscopia	nat	ar	586	1720
Sonchus oleraceus	nat	ar	586	1584

relationships between the distribution of alien plants in invaded regions and their residence time (e.g. Castro et al. 2005, Pyšek & Jarošík 2005, Williamson et al. 2009).

Invasion levels by regions

Maps of invasion levels are based on the cumulative record of species occurrence over the past 50 years (since 1970), expressed as the proportion of alien species number to the total flora (Fig. 8). The distribution of hotspots (10% of highest proportions of alien species numbers) and coldspots (10% of lowest proportions) is shown in Fig. 9. All maps

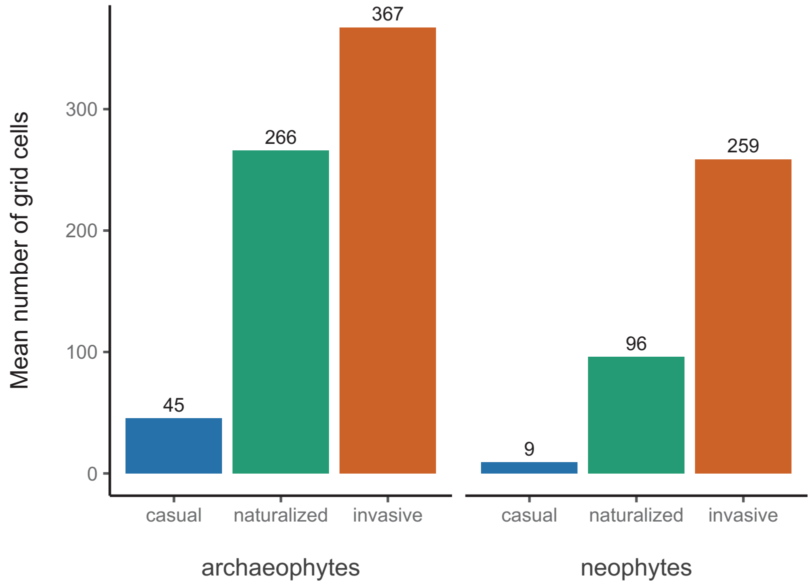


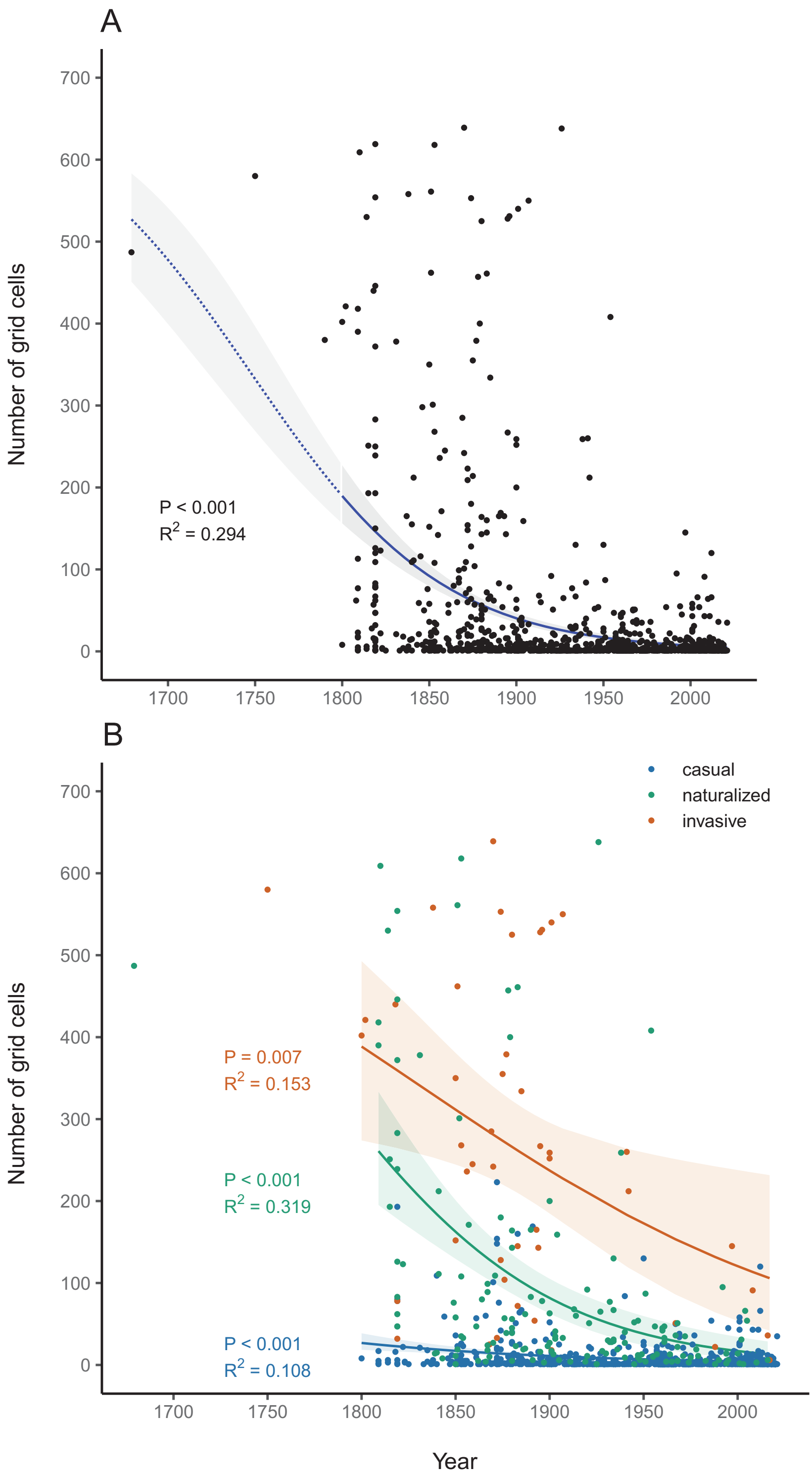
Fig. 6. Occupancy of grid cells by invasion status (casual; naturalized; invasive) and residence time (archaeophytes, neophytes) in the alien flora of the Czech Republic. The generalized linear model with a quasi-Poisson distribution (no. of grid cells ~ residence time + invasion status) revealed a significant effect of residence time ($P < 0.001$) and invasion status ($P < 0.001$).

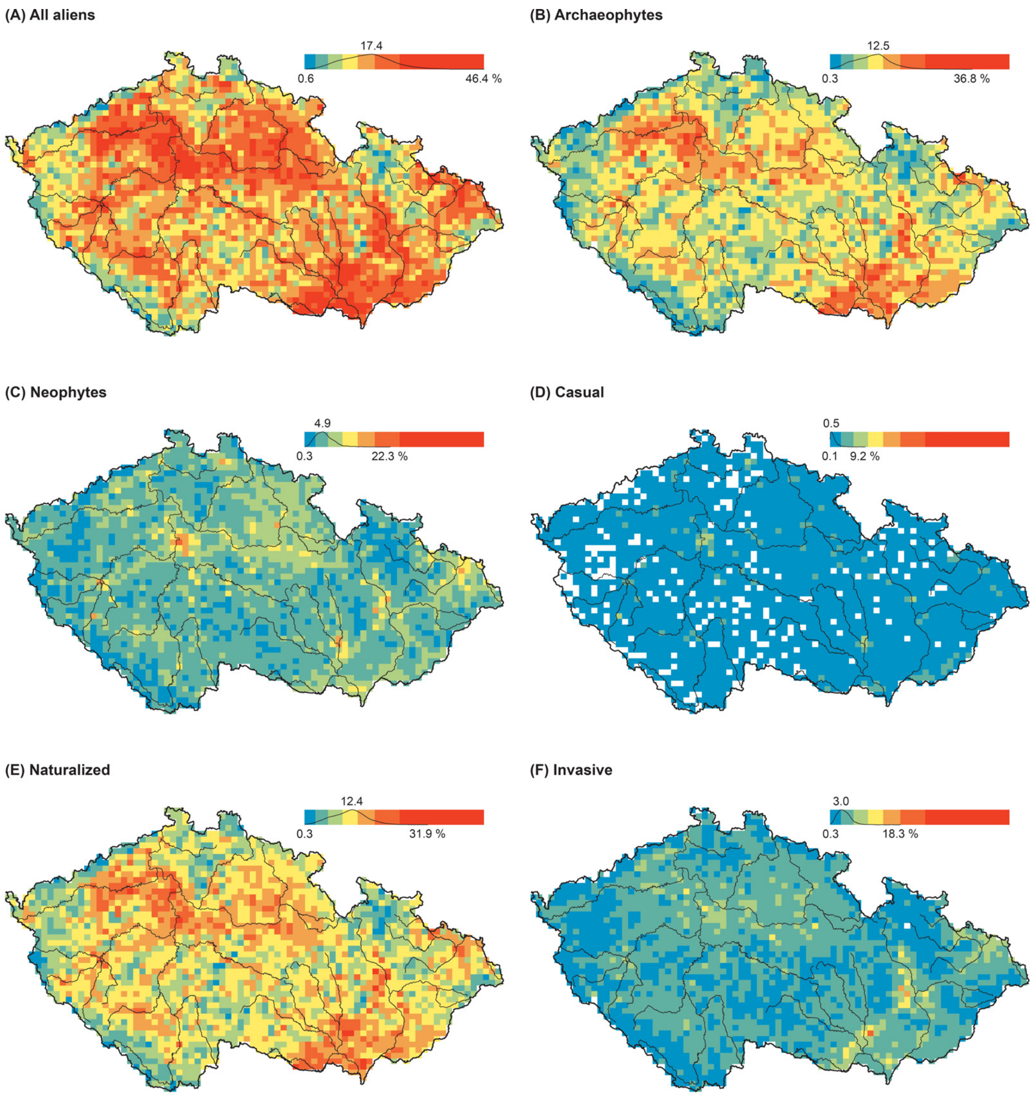
show that aliens are relatively more prevalent in the lowlands than at higher elevations of the Czech Republic (see Fig. 8G for geographical features of the country).

The categories of all aliens, archaeophytes and naturalized species show a similar pattern in the maps, with high levels of invasion and hotspots associated with agricultural lowlands. In contrast, neophytes in general, invasive aliens in general, and invasive neophytes are associated with urban, industrial or mining areas and lowland river floodplains. Naturalized neophytes have a similar distribution of hotspots but lack strong ties to rivers. Coldspots of all species groups are located in the mountains, especially in areas without intensive agricultural use. Casual aliens have both high invasion levels and hotspots in cities and regionally also in south-eastern Moravia, which is the Pannonian part of the country; their coldspots are scattered at higher elevations.

Overall, the proportion of alien species in grid-cell quadrants varies from less than 1% of the total grid-cell quadrant flora to heavily invaded areas with 46.4% of alien species. This invasion pattern is consistent with data from the previous edition of the catalogue (mapped by Chytrý et al. 2021) and corresponds to previously published maps of plant invasions based on interpolation of vegetation-plot data (Chytrý et al. 2009a, b) and the occurrence of 40 invasive neophytes (Pyšek et al. 2012b). The maps reflect the previously described fact that archaeophytes have a larger grid-cell occupancy than neophytes

Fig. 7. (A) Relationship between the number of grid cells occupied by alien plant taxa and their residence time, expressed as the year of introduction (note that archaeophytes first recorded as escaped from cultivation within the time period shown are also included), and (B) the same relationship shown separately for neophytes: casuals, naturalized and invasive taxa. Regression lines are based on generalized linear models with the quasi-binomial distribution (next page).


A
Number of grid cells
700
600
500
400
300
200
100
0
1700
1750
1800
1850
1900
1950
2000
P < 0.001
R2 = 0.294
B
casual
naturalized
invasive
P = 0.007
R2 = 0.153
P < 0.001
R2 = 0.319
P < 0.001
R2 = 0.108
Year



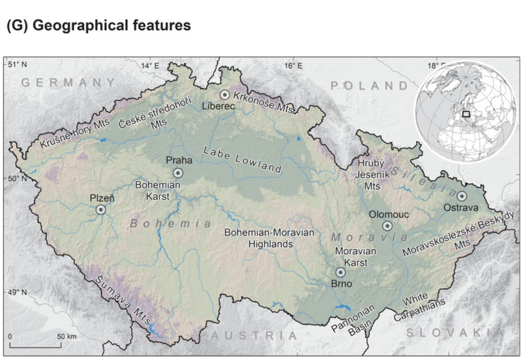


Fig. 8. Maps of the levels of invasion by alien species in the Czech Republic shown for all aliens (A), separately for the categories of residence status, i.e. archaeophytes (B), neophytes (C), and categories of invasion status (irrespective of residence time), i.e. casuals (D), naturalized (E) and invasive species (F). The proportion of alien species in a given category relative to the total flora of each grid cell quadrant (~5.5 × 6.0 km) is shown. The colour scale was determined by k-means clustering of the values of all mapped categories combined. Grid cells with zero values are white. The legend shows the distribution of mapped values (black curve), the minimum, maximum and median values. Geographical features of the Czech Republic are presented in (G).

in the Czech flora (Fig. 6), which is related to the availability of suitable habitats; agricultural land where archaeophytes prevail recently covers ~48% of the Czech territory (NCA CR 2021). Another factor is the time since introduction (Table 2), leading to broader distribution and greater abundance (Pyšek & Jarošík 2005).

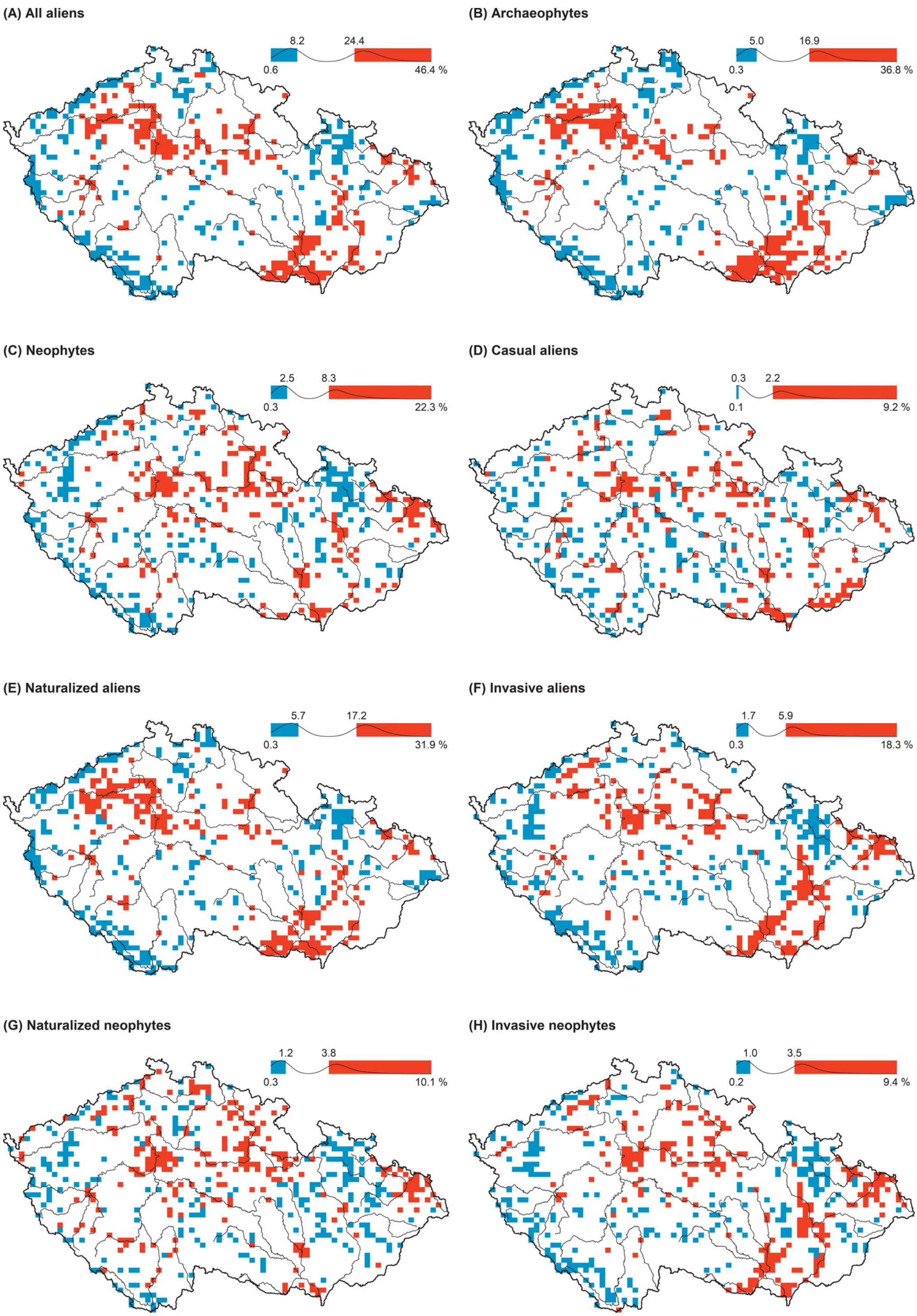
Three main factors underly the observed patterns: climatic constraints due to increasing elevation (Pyšek et al. 2011b), habitat invasibility associated with ecological conditions, land-use and disturbance regimes (Davis et al. 2000, Pyšek et al. 2005, Chytrý et al. 2008b, Pyšek & Chytrý 2014), and propagule pressure resulting from human activities (e.g. Chytrý et al. 2008a, Lockwood et al. 2009, Simberloff 2009). Our maps indicate that several factors influence the distribution of groups of alien species in different ways. The distribution of archaeophytes, which are widespread across much of the Czech Republic, is limited by the harsh climate and reduced habitat availability at higher elevations, whereas neophytes, which are concentrated in urban areas and floodplains, are more likely to be limited by low propagule pressure or soils poor in nutrients. The distribution in urban and industrial areas (but not only there, as illustrated for casual species) reflects the pathways of alien species introductions into the Czech flora; casuals depend on repeated introductions of propagules (Richardson et al. 2000, Blackburn et al. 2011), a condition most likely to be met where alien plants are cultivated and escape or are introduced directly through human activities such as transportation, construction, and trade (e.g. Hulme 2009b).

European and global context

By European standards, the Czech Republic is a moderately invaded country, with 264 naturalized neophytes in an area of 78,864 km^2. The data from 2012, when the Czech Republic harboured 249 neophytes, even placed the country exactly on the line of increase in naturalized species richness with area. The current data show the country to be slightly richer in naturalized species than would be the European average, placing it in a similar position to Lithuania, Estonia or Poland. The only markedly richer countries of more or less comparable sizes are Bulgaria, Belgium and Denmark, while some others, such as Switzerland, Hungary and Greece, harbour fewer naturalized species (Fig. 10). It needs to be noted, however, that this comparison has limited validity, as it depends in part on the quality of data for each country (e.g. Lambdon et al. 2008), the intensity of research on plant invasions and the date when the checklists for individual countries were produced.

Overall, alien taxa that occupy many grid cells in the Czech Republic have successfully naturalized in other parts of the world. The relationship is highly significant for the European continent, reflecting geographical proximity, but even stronger for temperate regions of the world (Fig. 11A), indicating the importance of climate match in invasions (Pauchard et al. 2004, Hulme 2009a, Pyšek et al. 2020a).

Fig. 9. Maps of invasion hotspots and coldspots of alien species in the Czech Republic, shown for all aliens (A), archaeophytes (B), neophytes (C), casual aliens (D), naturalized aliens (E), invasive aliens (F), naturalized neophytes (G) and invasive neophytes (H). Grid-cell quadrants (~5.5 × 6.0 km) with 10% of the highest (red) and 10% of the lowest (blue) proportions of a given alien species category relative to the total flora of a grid cell are shown. The legend shows the distribution of mapped values (black line), minimum, maximum, 10% and 90% quantiles (next page).


(A) All aliens
8.2
24.4
0.6
46.4 %
(B) Archaeophytes
5.0
16.9
0.3
36.8 %
(C) Neophytes
2.5
8.3
0.3
22.3 %
(D) Casual aliens
0.3
2.2
0.1
9.2 %
(E) Naturalized aliens
5.7
17.2
0.3
31.9 %
(F) Invasive aliens
1.7
5.9
0.3
18.3 %
(G) Naturalized neophytes
1.2
3.8
0.3
10.1 %
(H) Invasive neophytes
1.0
3.5
0.2
9.4 %

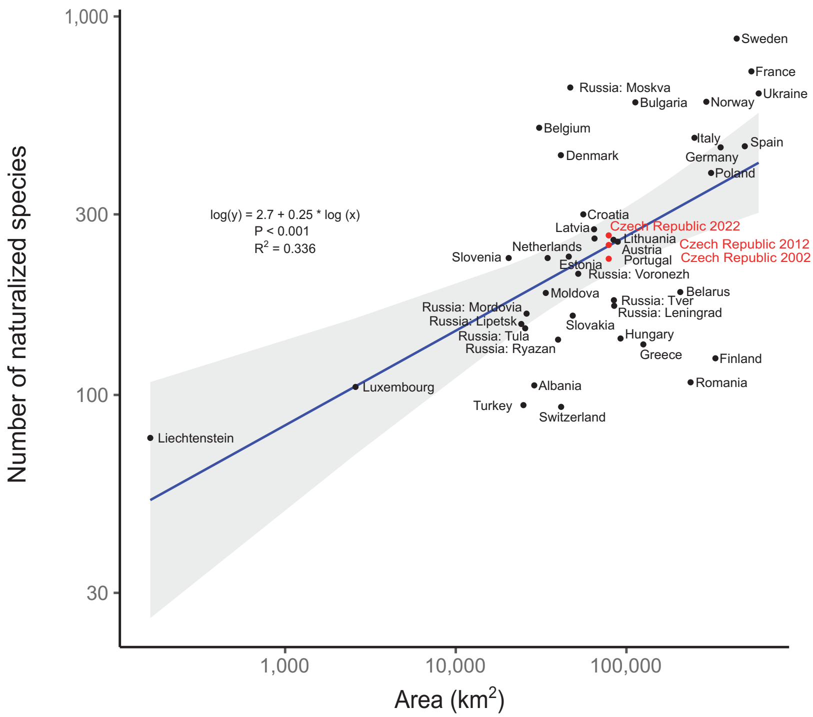


Fig. 10. Position of the Czech Republic in the species-area relationship of European naturalized floras (based on GloNAF data as presented in Pyšek et al. 2017b) and its changes over time, represented by three red points derived from Pyšek et al. 2002, 2012 and the current edition. Note that only naturalized neophytes are included in the GloNAF database (van Kleunen et al. 2019) and plotted on the y-axis. The regression line is based on a linear model with a log-transformed response and predictor variables. Note that the Russian districts are referred to by city names.

The species in the bottom right portion of the plot shown in Fig. 11B are disproportionately less common in the grid cells of the Czech Republic than in the GloNAF regions of the world. Considering only temperate regions to reflect, to a certain extent, the climatic match, this is especially true for *Brassica juncea* (8 grid cells/105 GloNAF temperate regions), *Eleusine indica* (7/86), *Foeniculum vulgare* (13/97), *Artemisia annua* (19/95), *Brassica nigra* (21/83), *Amaranthus hybridus* (22/89), *Coriandrum sativum* (24/84), *Lolium temulentum* (28/86), *Hibiscus trionum* (32/94), or *Ipomoea purpurea* (34/91). It needs to be noted that there are 214 temperate regions in the GloNAF database (Pyšek et al. 2017a) compared to 679 grid cells in the Czech Republic – even the species with the greatest occupancy on the above list, *I. purpurea*, occurs in only 5% of grid cells compared to 43% of the potential global distribution range. Some of the above species may therefore spread in the Czech Republic in the future, although the probability of this happening depends on many other factors (Pyšek et al. 2020a).

Structure of the Czech alien flora: taxonomy and life forms

Alien taxa in the Czech Republic are recruited from 630 genera (plus three intergeneric hybrids, ×*Festulolium*, ×*Pseudomatricaria*, and ×*Tripleurothermis*); casuals from 522 genera, naturalized taxa from 246 genera, and invasives from 58 genera. *Amaranthus* (26 taxa),

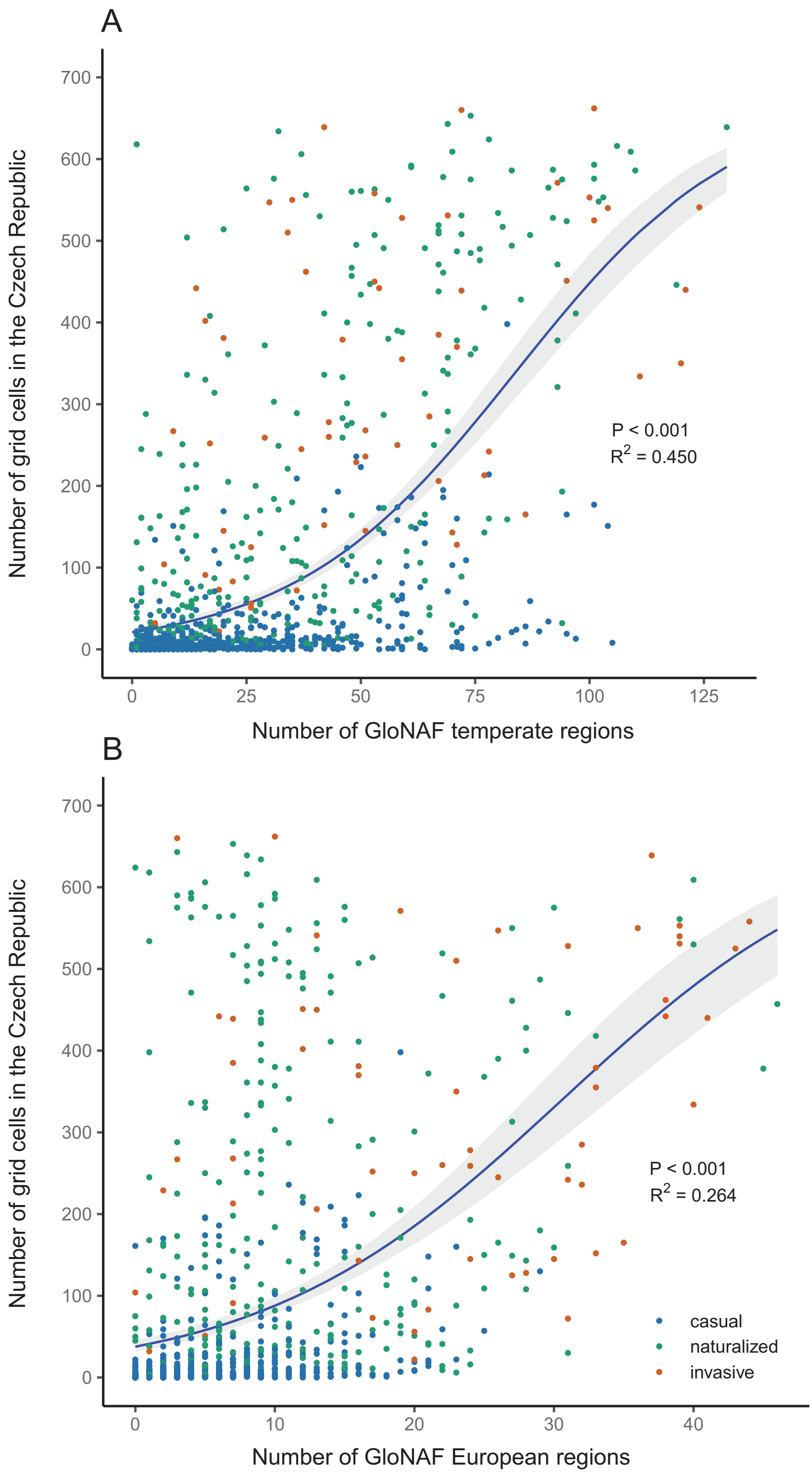
Table 7. Overview of the most represented genera in the Czech alien flora, comprising at least 10 taxa (including hybrids). Numbers of taxa are shown for combinations of residence time category and invasion status.

	Casual			Naturalized			Invasive			
Genus	Archaeophyte	Neophyte	Total	Archaeophyte	Neophyte	Total	Archaeophyte	Neophyte	Total	Total
Amaranthus	1	15	16	1	6	7	–	3	3	26
Oenothera	–	16	16	–	7	7	–	–	–	23
Centaurea	1	15	16	1	3	4	–	–	–	20
Trifolium	–	15	15	1	2	3	–	–	–	18
Chenopodium	1	10	11	5	2	7	–	–	–	18
Viola	7	6	13	3	1	4	–	–	–	17
Bromus	1	9	10	5	1	6	1	–	1	17
Solanum	1	13	14	–	2	2	–	–	–	16
Rumex	–	12	12	–	3	3	–	1	1	16
Euphorbia	–	10	10	4	2	6	–	–	–	16
Allium	3	10	13	1	–	1	–	1	1	15
Vicia	3	5	8	6	1	6	–	–	–	15
Rubus	–	9	9	–	5	5	–	–	–	14
Epilobium	–	11	11	–	2	2	–	–	–	13
Artemisia	2	7	9	2	2	4	–	–	–	13
Geranium	–	6	6	3	4	7	–	–	–	13
Veronica	–	3	3	7	3	10	–	–	–	13
Lathyrus	1	8	9	1	2	3	–	–	–	12
Lepidium	1	4	5	4	3	7	–	–	–	12
Prunus	2	3	5	5	–	5	1	1	2	12
Silene	2	6	8	2	1	3	–	–	–	11
Sedum	–	6	6	–	4	4	–	–	–	10
Atriplex	3	3	6	2	–	2	1	1	2	10

Table 8. Overview of the most species-rich families in the Czech alien flora, comprising more than 10 taxa (including hybrids). The numbers of taxa are shown for combinations of residence time and invasion status.

	Casual			Naturalized			Invasive			
Family	Archaeophyte	Neophyte	Total	Archaeophyte	Neophyte	Total	Archaeophyte	Neophyte	Total	Total
Asteraceae	24	115	139	25	22	47	2	19	21	207
Poaceae	13	114	127	13	18	31	10	–	10	168
Brassicaceae	15	49	64	21	14	35	2	2	4	103
Rosaceae	7	54	61	11	24	35	1	1	2	98
Fabaceae	6	61	67	12	14	25	–	2	2	95
Amaranthaceae	10	43	53	10	10	20	1	7	8	81
Lamiaceae	16	30	46	12	7	19	–	–	–	65
Apiaceae	12	21	33	11	1	12	–	1	1	46
Onagraceae	–	31	31	–	9	9	–	–	–	40
Caryophyllaceae	6	16	22	8	6	14	–	1	1	37
Plantaginaceae	1	14	15	15	7	22	–	–	–	37
Solanaceae	1	27	28	3	4	7	–	1	1	36
Boraginaceae	2	20	22	6	3	9	–	–	–	31
Polygonaceae	1	18	19	–	6	6	–	4	4	29
Malvaceae	3	17	20	5	–	5	–	1	1	26
Ranunculaceae	4	14	18	4	4	8	–	–	–	26
Papaveraceae	3	11	14	8	3	11	–	–	–	25

Fig. 11. Relationship between grid-cell occupancy and the number of regions where the species is naturalized displayed for (A) temperate regions globally and (B) Europe. Regression lines are based on generalized linear models with the quasi-binomial distribution (next page).


A
Number of grid cells in the Czech Republic
0
100
200
300
400
500
600
700
0
25
50
75
100
125
Number of GloNAF temperate regions
P < 0.001
R2 = 0.450
B
Number of grid cells in the Czech Republic
0
100
200
300
400
500
600
700
0
10
20
30
40
Number of GloNAF European regions
P < 0.001
R2 = 0.264
casual
naturalized
invasive

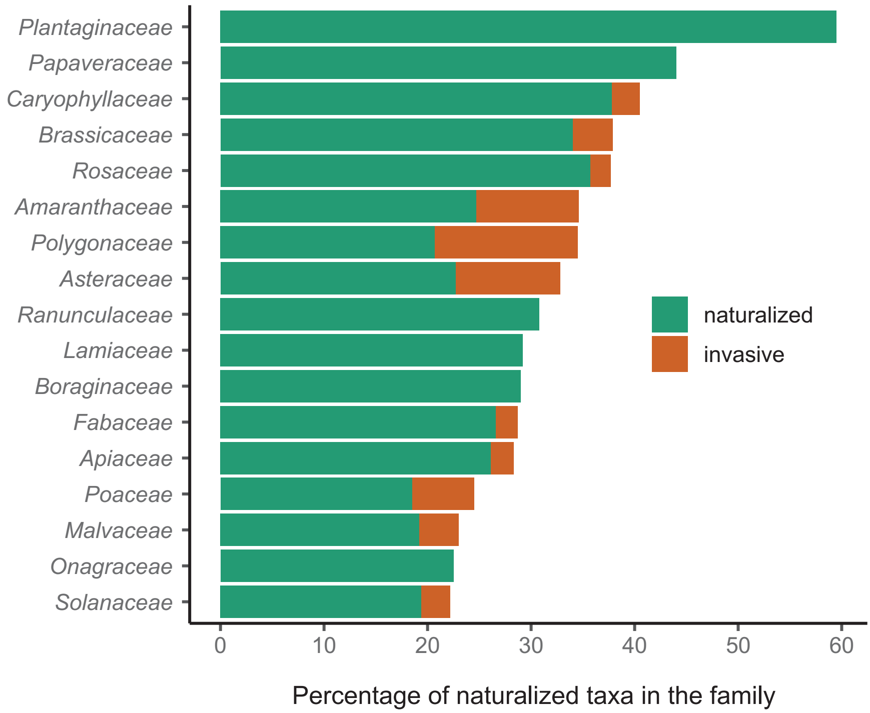
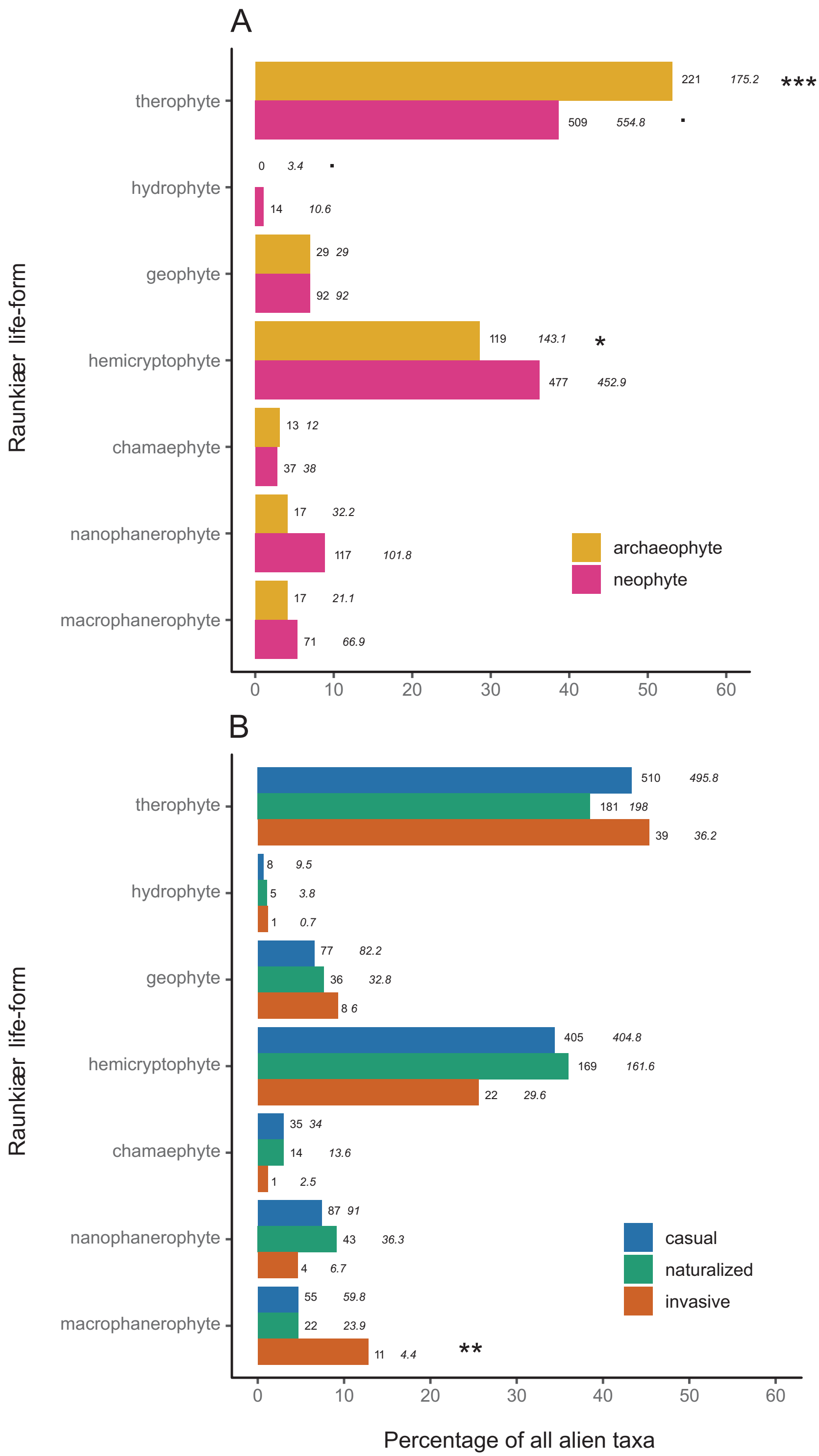


Fig. 12. Naturalization and invasion success measured as the percentage of naturalized taxa among all aliens within each family, and the percentage of invasive among naturalized, respectively.

Oenothera (23), *Centaurea* (20), *Chenopodium*, *Trifolium* (18 each), *Bromus*, *Viola* (17 each), and *Euphorbia*, *Rumex* and *Solanum* (16 each) are the genera represented by more than 15 taxa (Table 7). Of the invasive taxa, four belong to *Symphyotrichum*, and three to *Amaranthus*, *Setaria* and *Reynoutria*. Among naturalized taxa, *Veronica* (10 taxa), *Amaranthus*, *Oenothera*, *Chenopodium*, *Geranium* and *Lepidium* (7 each) are the most represented. Some genera have a markedly low naturalization success, measured as the proportion of all alien taxa that are naturalized (i.e. including invasives); considering only the genera with at least 10 members in the Czech alien flora, these are *Solanum* (only two of a total of 16 taxa are naturalized, i.e. 12.5%), *Allium* (2/15, i.e. 13.3%), *Epilobium* (2/13, i.e. 15.4%), and *Trifolium* (3/18, i.e. 16.7%), while *Veronica* (10 of 13 taxa naturalized, i.e. 76.9%), *Lepidium* and *Prunus* (7/12, i.e. 58%) represent the reverse case. It needs to be noted that the low naturalization success in *Epilobium* is due to a high number of hybrids with an alien *E. adenocaulon* that are effectively sterile and only spread vegetatively.

Fig. 13. Frequency distribution of life forms (Raunkiær 1934, see text for details) in Czech alien flora, presented by (A) residence time and (B) invasion status. Observed counts of taxa in each life-form category indicated on the right of the bars (plain font) differ highly significantly between residence times ($\chi^2 = 36.06$; df = 6; $P < 0.001$) and marginally significantly among invasion statuses ($\chi^2 = 20.39$; df = 12; $P < 0.060$) from counts expected by chance (values in italics). Statistically significant deviations of individual counts tested by the chi-squared statistics from randomly expected counts are expressed by symbols (*** $P < 0.001$; ** $P < 0.01$; * $P < 0.05$; ▪ $P < 0.1$); bars without a symbol do not differ from randomly expected values (next page).


A
Raunkiær life-form
therophyte
hydrophyte
geophyte
hemicryptophyte
chamaephyte
nanophanerophyte
macrophanerophyte
221 175.2 ***
509 554.8 .
0 3.4 .
14 10.6
29 29
92 92
119 143.1 *
477 452.9
13 12
37 38
17 32.2
117 101.8
17 21.1
71 66.9
archaeophyte
neophyte
0 10 20 30 40 50 60
B
Raunkiær life-form
therophyte
hydrophyte
geophyte
hemicryptophyte
chamaephyte
nanophanerophyte
macrophanerophyte
510 495.8
181 198
39 36.2
8 9.5
5 3.8
1 0.7
77 82.2
36 32.8
8 6
405 404.8
169 161.6
22 29.6
35 34
14 13.6
1 2.5
87 91
43 36.3
4 6.7
55 59.8
22 23.9
11 4.4 **
casual
naturalized
invasive
0 10 20 30 40 50 60
Percentage of all alien taxa

In terms of family membership, there are taxa from 113, 68 and 29 families among the casual, naturalized and invasive taxa, respectively (122 families in total). The richest families are *Asteraceae* (207 alien taxa), *Poaceae* (168), *Brassicaceae* (103), *Rosaceae* (98), and *Fabaceae* (94), followed by *Amaranthaceae* (81), *Lamiaceae* (65), *Apiaceae* (46) and others (Table 8). The 20 families with the highest number of aliens in the Czech flora account for 1205 taxa, i.e. 77% of the total alien flora of this country.

Families vary greatly in their naturalization and invasion success, measured as the percentage of naturalized and invasive taxa, respectively, among all alien taxa in the respective family (Fig. 12). *Plantaginaceae* and *Papaveraceae* have the highest naturalization success with 59% and 44% of their taxa naturalized, respectively, but none of their members is invasive at present. Other families rich in alien taxa that do not include any invasive taxon include *Ranunculaceae*, *Lamiaceae*, *Boraginaceae* and *Onagraceae*. The highest invasion success is associated with several large families that have been shown to frequently harbour invasive species (e.g. Daehler 1998, Pyšek 1998, Lambdon et al. 2008, Pyšek et al. 2017b): *Polygonaceae* (four of the 29 members are invasive, i.e. 13.8%), *Asteraceae* (21/207, 10.1%), *Amaranthaceae* (8/81, 9.8%) and *Poaceae* (10/168, 6.0%).

The analysis of growth forms was presented in the previous edition of this catalogue, revealing that 43% of alien taxa were annuals, 33% perennials, 11% biennials, 9% shrubs or semi-shrubs, and 4% trees. Archaeophytes were significantly more often annuals or biennials and less often perennials, shrubs or trees than were neophytes (see Pyšek et al. 2012b). Here we present the categorization of life forms based on the classification of Raunkiær (1934, see also Chytrý et al. 2021 for details). Among all alien taxa, therophytes were the most represented group (730 taxa, representing 42.1% of the total). Other frequent life forms in the alien flora of the country include hemicryptophytes (596 taxa, 34.4%), nanophanerophytes (134 taxa, 7.7%), geophytes (121 taxa, 7.0%) and phanerophytes (88 taxa, 5.1%). The representation of chamaephytes (50 taxa, 2.9%) and hydrophytes (14 taxa, 0.8%) is lower. From these figures, it follows that woody plants, comprising nano- and macrophanerophytes and some chamaephytes, account for ~13% of aliens, and herbs account for ~87%.

The representation of life forms differed with regard to residence time and invasion status. Therophytes were more represented and hemicryptophytes less represented among archaeophytes than among neophytes (Fig. 13A). The representation of life forms within invasion status categories was more or less comparable, except for macrophanerophytes (i.e. trees), whose percentage among invasive taxa was almost three times that among naturalized or casual taxa (12.8% vs 4.7%, respectively). The opposite trend, i.e. under-representation among invaders, seems to occur in hemicryptophytes, but this difference was not significant (Fig. 13B). This pattern is consistent with the repeatedly documented high potential of woody species to invade and cause impacts (e.g. Binggeli 1996, Richardson 1998, Křivánek et al. 2006, Pyšek et al. 2012c, Rejmánek & Richardson 2013).

Origin of alien taxa in the Czech flora

Most alien plants arrived in the Czech Republic from the Mediterranean region (618 taxa, i.e. 31.5%), other parts of Europe (380 taxa, 19.4%), other parts of Asia (290 taxa, 14.1%) and North America (262, 13.4%). The contributions of other regions (Central America, South America, Africa, Australia) did not exceed 5%. The region of origin

Table 9. Regions of origin for the alien flora in the Czech Republic. The number of taxa originating from a given region is shown for the categories of invasion status and residence time. For archaeophytes, some regions are not applicable (n.a.) because they cannot originate from them by definition. Note that the total number of taxon-origin cases exceeds the total number of taxa because some species are native to more than one region of origin, as defined here (Appendix 2).

	Archaeophytes			Neophytes			All aliens per region
	Casual	Naturalized	Invasive	Casual	Naturalized	Invasive	
Europe	21	70	5	205	67	12	380
Mediterranean	73	157	15	311	54	8	618
North America	n.a.	n.a.	n.a.	177	58	27	262
Central America	n.a.	n.a.	n.a.	49	3	3	55
South America	n.a.	n.a.	n.a.	73	5	3	81
Asia	14	28	4	194	38	12	290
Africa	3	2	1	36	2	1	45
Australia	n.a.	n.a.	n.a.	26	1	1	28
Hybrid	31	7	0	51	11	4	104
Anecophyte	26	15	1	40	13	1	96

could not be assigned for 200 taxa, a group consisting of 104 anecophytes and 96 taxa of hybrid origin (Table 9). These proportions, representing the contribution of individual regions of origin to the alien flora of the Czech Republic, have remained largely the same compared to the previous edition of the catalogue (Pyšek et al. 2012b). However, minor differences can be observed, namely an increase in the contribution of Asia and North America by 1.0 and 0.8 percentage points, respectively, mainly at the expense of the taxa of Mediterranean origin, which decreased from 34.6% to the current value of 31.5%. Although this may reflect the steadily increasing introduction of taxa around the globe (Seebens et al. 2017, 2021) and improved opportunities to spread for plants from more distant regions, it is difficult to assess whether these numbers indicate a trend or are due to random fluctuations.

The data on taxon origins also confirm the difference already reported for the Czech Republic and elsewhere between archaeophytes and neophytes in terms of source regions (e.g. Pyšek et al. 2004b, 2005, Chytrý et al. 2008a, b). More than half (51.8%) of the archaeophytes originate from the Mediterranean region, which is also the most frequent donor of neophytes (25.1%). The contribution of other parts of Europe to archaeophytic and neophytic flora is approximately equal (20.3% and 19.1%, respectively), and archaeophytes are more common among anecophytes and hybrids (Fig. 14A).

North American taxa form the largest group among invasive taxa (27, corresponding to 27.6% of all invasive archaeophytes and neophytes), followed by Mediterranean taxa

Fig. 14. Regions of origin by (A) residence time and (B) invasion status. The bars and figures on top show the percentage of taxa in each category (archaeophyte, neophyte; casual, naturalized, invasive) that originated in each region. Observed percentages of taxa from each region indicated on the right of the bars (plain font) differed highly significantly both between resident times ($\chi^2 = 65.470$; df = 3; $P < 0.001$) and among invasive statuses ($\chi^2 = 98.367$; df = 14; $P < 0.001$) from counts expected by chance (values in italics). Statistically significant deviations of individual counts from randomly expected counts tested by the chi-squared statistics are expressed by symbols (*** $P < 0.001$; ** $P < 0.01$; * $P < 0.05$; ▪ $P < 0.1$); bars without a symbol do not differ from randomly expected values. Note that anecophytes, hybrids and regions where only one group was present were not included in testing (next page).

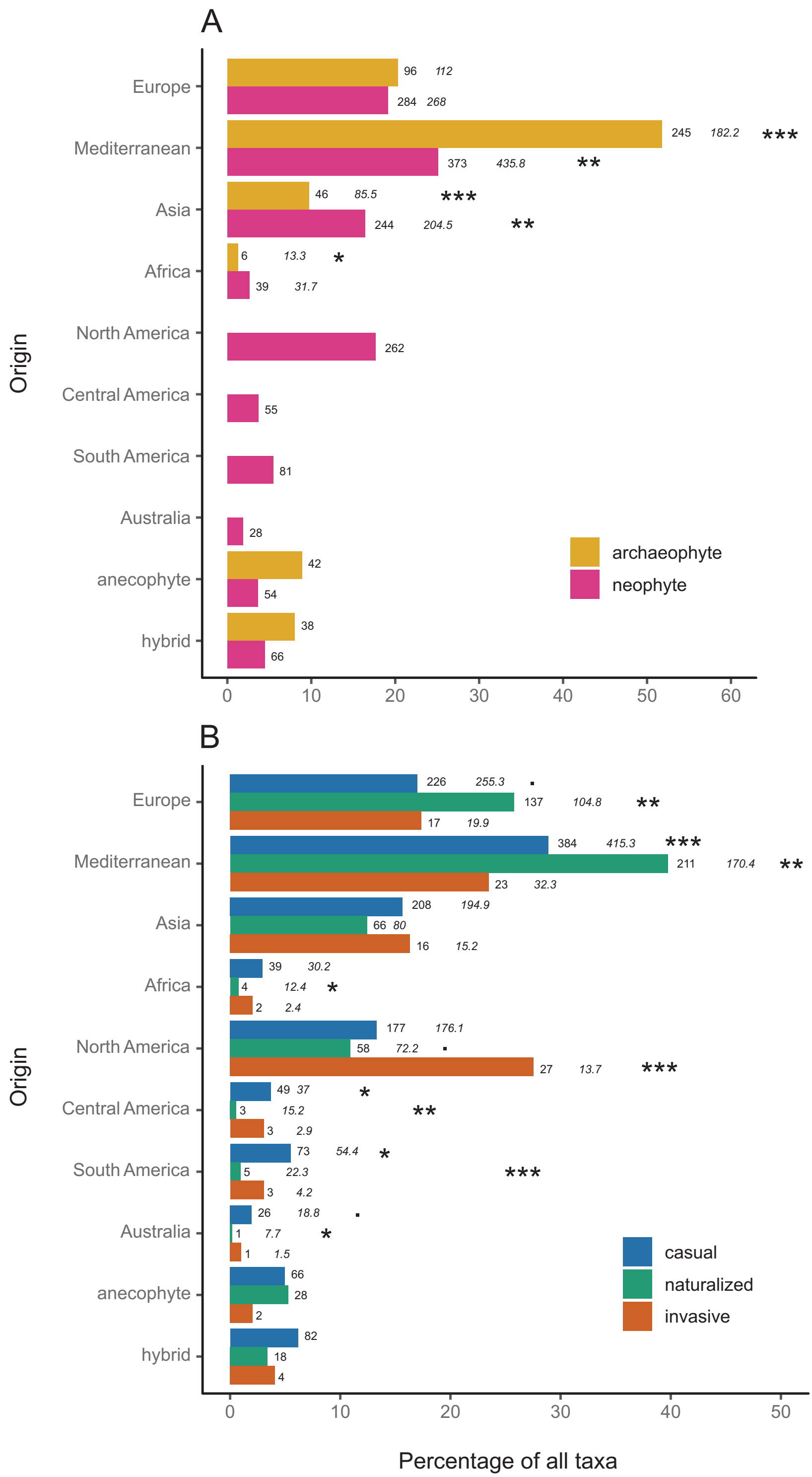

A
Europe
Mediterranean
Asia
Africa
North America
Central America
South America
Australia
anecophyte
hybrid
Origin
96 112
284 268
245 182.2 ***
373 435.8 **
46 85.5 ***
244 204.5 **
6 13.3 *
39 31.7
262
55
81
28
42
54
38
66
archaeophyte
neophyte
0 10 20 30 40 50 60
B
226 255.3 .
137 104.8 **
17 19.9
384 415.3 ***
211 170.4 **
23 32.3
208 194.9
66 80
16 15.2
39 30.2
4 12.4 *
2 2.4
177 176.1
58 72.2 .
27 13.7 ***
49 37 *
3 15.2 **
3 2.9
73 54.4 *
5 22.3 ***
3 4.2
26 18.8 .
1 7.7 *
1 1.5
66
28
2
82
18
4
casual
naturalized
invasive
0 10 20 30 40 50
Percentage of all taxa

Table 10. The numbers of taxa occurring in SynHab habitat types (see text for details), presented by invasion status and residence time. Note that the classification was not applied to casual taxa and is presented for naturalized non-invasive and invasive taxa.

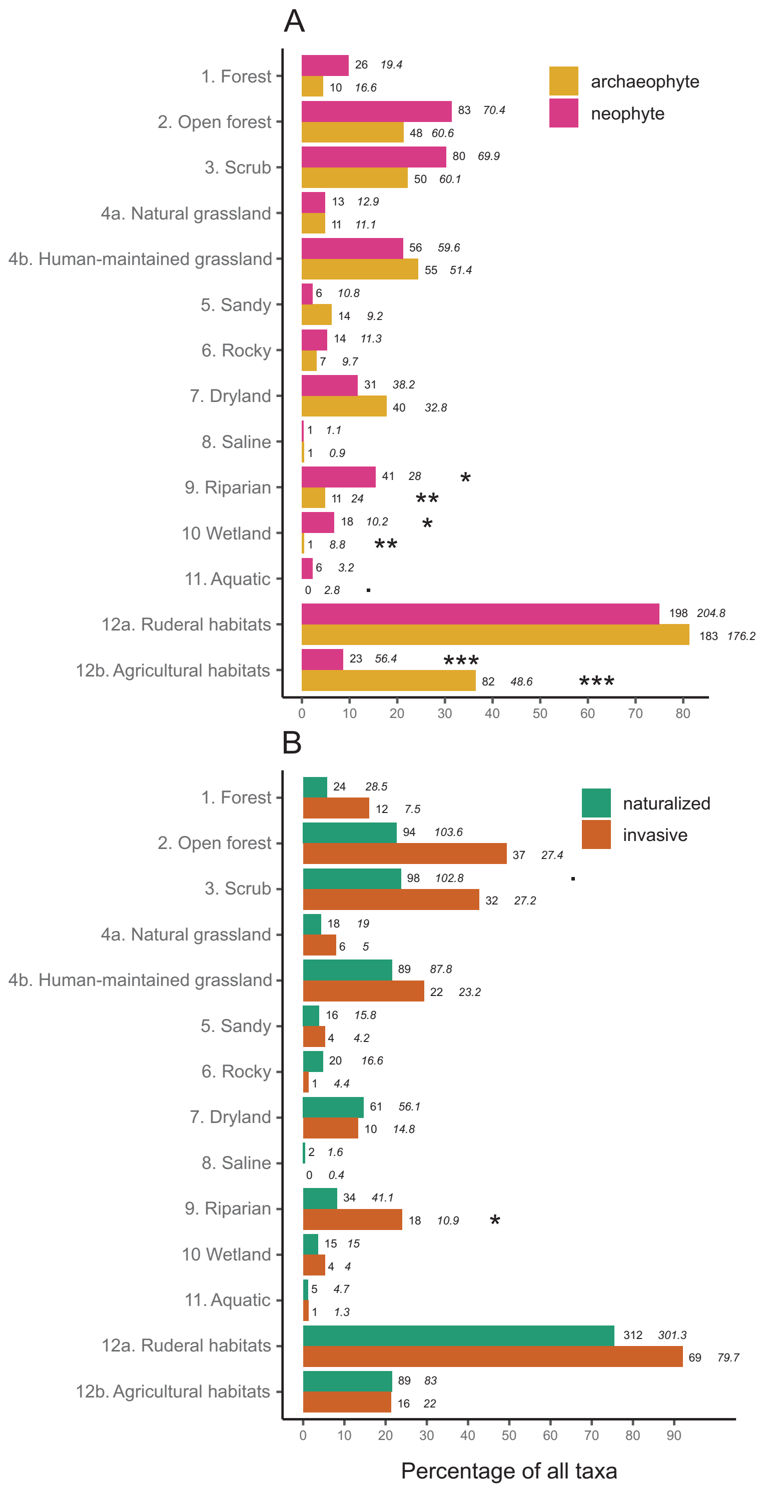
	Total	Naturalized	Invasive	Archaeophytes	Neophytes
1. Forest	36	24	12	10	26
2. Open forest	131	94	37	48	83
3. Scrub	130	98	32	50	80
4a. Natural grassland	24	18	6	11	13
4b. Human-maintained grassland	111	89	22	55	56
5. Sandy	20	16	4	14	6
6. Rocky	21	20	1	7	14
7. Dryland	71	61	10	40	31
8. Saline	2	2	0	1	1
9. Riparian	52	34	18	11	41
10. Wetland	19	15	4	1	18
11. Aquatic	6	5	1	0	6
12a. Ruderal habitats	381	312	69	183	198
12b. Agricultural habitats	105	89	16	82	23

(23), taxa from other parts of Europe (17) and those from other parts of Asia. The pattern is different for naturalized taxa, where Mediterranean origin prevails (211 taxa, 39.7%), and other parts of Europe also deliver disproportionally high numbers of plants that have successfully naturalized in the Czech Republic. Casual taxa originated mainly from the Mediterranean region, Europe, Asia and North America. Nevertheless, Africa and Central and South America are disproportionately more frequent as donor areas for this group of invasion status (Fig. 14B).

Habitats

In the previous edition of the catalogue (Pyšek et al. 2012b), the occurrence in habitats was considered using a system developed by Sádlo et al. (2007), consisting of 88 major habitat types in the Czech Republic that correspond to phytosociological alliances or groups of alliances. This analysis revealed that archaeophytes occupied, on average, more habitats than neophytes, and over 30% of them occurred in more than 10 habitats, while the corresponding figure for neophytes was only 18% (Pyšek et al. 2012b). The occurrence of invasive taxa in this system of habitats was presented in a follow-up analysis of the Czech alien flora (Pyšek et al. 2012a); this article also contains data on levels of invasion and covers of alien species in all vegetation units at the rank of alliances, separately

Fig. 15. (A) Representation of archaeophytes and neophytes in SynHab habitat categories expressed as the percentage of the total of naturalized archaeophytes and neophytes, n = 228 and 264, respectively, occurring in a given habitat type. (B) Representation of naturalized and invasive taxa in habitats expressed as the percentage of the total of naturalized and invasive taxa, n = 417 and 75, respectively, that occur in a given habitat type. The bars and figures on the right show the percentage of taxa in each category (archaeophyte, neophyte; naturalized, invasive) occurring in a given habitat. Observed counts differ significantly both between residence times (χ^2 = 96.83; df = 13; P < 0.001) and among invasive statuses (χ^2 = 24.68; df = 13; P < 0.025) from counts expected by chance (values in italics). Statistically significant deviations of individual counts from randomly expected counts tested by the chi-squared statistics are expressed by symbols (*** P < 0.001; ** P < 0.01; * P < 0.05; ▪ P < 0.1); bars without a symbol do not differ from randomly expected values (next page).


A
archaeophyte
neophyte
1. Forest
26 19.4
10 16.6
2. Open forest
83 70.4
48 60.6
3. Scrub
80 69.9
50 60.1
4a. Natural grassland
13 12.9
11 11.1
4b. Human-maintained grassland
56 59.6
55 51.4
5. Sandy
6 10.8
14 9.2
6. Rocky
14 11.3
7 9.7
7. Dryland
31 38.2
40 32.8
8. Saline
1 1.1
1 0.9
9. Riparian
41 28 *
11 24 **
10 Wetland
18 10.2 *
1 8.8 **
11. Aquatic
6 3.2
0 2.8 .
12a. Ruderal habitats
198 204.8
183 176.2
12b. Agricultural habitats
23 56.4 ***
82 48.6 ***
0 10 20 30 40 50 60 70 80
B
naturalized
invasive
1. Forest
24 28.5
12 7.5
2. Open forest
94 103.6
37 27.4
3. Scrub
98 102.8 .
32 27.2
4a. Natural grassland
18 19
6 5
4b. Human-maintained grassland
89 87.8
22 23.2
5. Sandy
16 15.8
4 4.2
6. Rocky
20 16.6
1 4.4
7. Dryland
61 56.1
10 14.8
8. Saline
2 1.6
0 0.4
9. Riparian
34 41.1
18 10.9 *
10 Wetland
15 15
4 4
11. Aquatic
5 4.7
1 1.3
12a. Ruderal habitats
312 301.3
69 79.7
12b. Agricultural habitats
89 83
16 22
0 10 20 30 40 50 60 70 80 90
Percentage of all taxa

for native species, archaeophytes and neophytes. During work on the current edition of the catalogue, habitat affiliations for all listed taxa were updated and integrated into the Pladias database (https://www.pladias.cz). As the robust overall patterns based on this classification of habitats (Sádlo et al. 2007) are largely consistent with those reported in previous articles, they are not presented here, and the reader is referred to the Pladias database.

Using the SynHab classification (Table 10), ruderal habitats were shown to be richest in naturalized plants; 381 taxa occurring there represent 77.9% of all naturalized aliens recorded in the country (n = 489). Other habitats harbouring more than 20% of all naturalized alien plants include open forests (131 taxa, 26.6%), scrub (130 taxa, 26.4%), and agricultural habitats (105 taxa, 21.5%). With few exceptions, the habitat affinities of archaeophytes and neophytes (expressed as the percentage among all 228 naturalized archaeophytes and 264 neophytes) are largely similar. However, archaeophytes are overrepresented in agricultural habitats, while neophytes in wetlands and riparian habitats (Fig. 15A). As invasive taxa occur in more habitats than other aliens, having broader habitat niches, the percentage of all invasives recorded in individual habitats tends to be higher than is the case for naturalized taxa; this is true for nearly all habitats. However, riparian habitats are the only habitat type where invasive taxa are significantly more prevalent than naturalized taxa, and the same marginally significant difference was found for scrub (Fig. 15B).

Regarding the habitat niche breadth of individual taxa, three species occur in six habitats (out of 14): *Fraxinus pennsylvanica*, *Heracleum mantegazzianum*, and *Ribes rubrum*, 16 taxa in five, 51 in four, 109 in three, 178 in two, and 134 taxa were only recorded in one habitat (Supplementary Table S1).

Introduction pathways

Of the total number of alien taxa that could be classified (Supplementary Table S2), 859 taxa were introduced and initially spread by intentional pathways and 772 unintentionally. With respect to invasion status, more casual taxa were spread by intentional than unintentional pathways (627 vs 469, respectively), but the ratio was reversed for naturalized (195 vs 260) and invasive taxa (37 vs 43). These results do not appear to confirm the previously reported pattern that pathways by which alien species are introduced intentionally as a commodity (direct release into the wild; escape from cultivation) result in easier naturalization and invasion than pathways of unintentional introduction, although those species that are introduced via unintentional pathways and become invasive are as widespread as intentionally introduced species (Pyšek et al. 2011a).

Among intentional introduction pathways, cultivation for ornamental purposes and subsequent escape is most common (577 taxa, representing 36.7% of all aliens, or 66.9% of all intentional introductions), followed by plants cultivated as crops (160 taxa, 10.2% of all aliens, or 18.5% of taxa introduced intentionally). Of the unintentional modes, vectors associated with anthropogenic habitats (362 taxa; 23.0% of all aliens; 47.1% of unintentionally introduced), weeds introduced with agriculture (196; 12.5%, 25.5%) and introductions with industrial activities (182; 11.6%; 23.7%) are the most prevalent (Fig. 16).

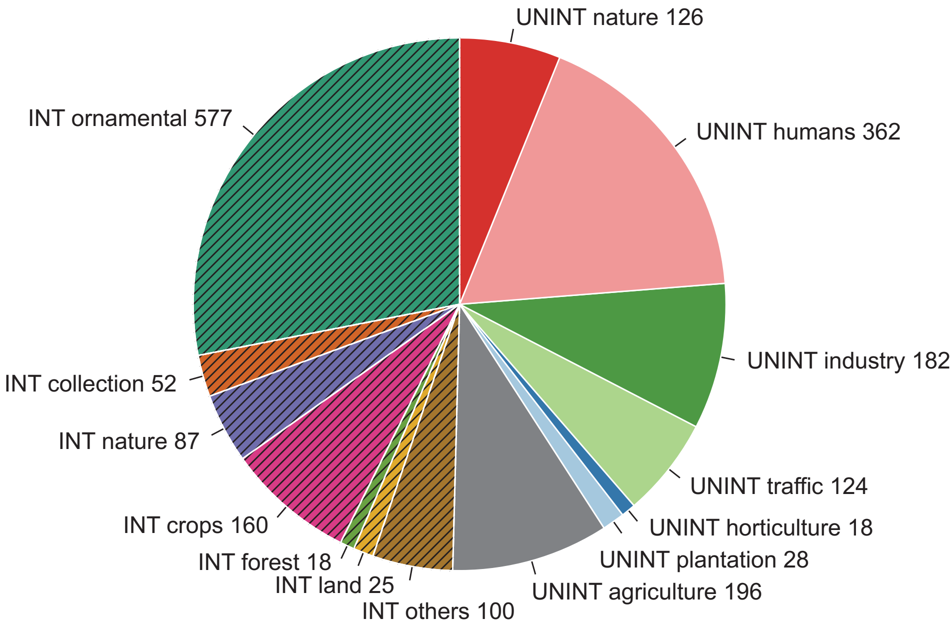


Fig 16. Numbers of taxa for which the particular mode of introduction into the Czech Republic is reported and considered to play a role in the initial phase of spread in this country. INT – intentional pathways, UNINT – unintentional pathways (see Methods for details on classification and coding).

Impacts: EICAT assessment of invasive taxa

Of the invasive taxa assessed, relevant information on environmental impact was found for 40 taxa (Table 11). The maximum impact value (EICAT score 5 – MV, massive) was found only for *Populus ×canadensis* and *Robinia pseudoacacia* (i.e. 5.0% of the assessed taxa), related to hybridization in the former taxon and chemical impact on ecosystems in the latter. The lowest scores were assigned to *Echinops sphaerocephalus* subsp. *sphaerocephalus* (EICAT score 1 – MN, minimum concern), *Juglans regia* and *Symphyotrichum ×salignum* (both EICAT score 2, minor), i.e. 2.5% and 5.0% of assessed taxa, respectively. The majority of maximum impacts identified were in the categories MR (major, score 4), with 24 taxa (60.0%) assigned this impact level, and MO (moderate, score 3), with 11 taxa, representing 27.5% of the taxa assessed.

The invasive taxa assessed exert their impact on the environment through seven mechanisms (out of the 12 defined in the EICAT scheme): competition (EICAT mechanism no. 1; see Blackburn et al. 2014), hybridization (no. 3), poisoning/toxicity (no. 6), chemical impact on ecosystem (no. 9), physical impact on ecosystem (no. 10), structural impact on ecosystem (no. 11), and indirect impacts through interactions with other species (no. 12). The most frequent were mechanisms linked to competition (30.5% of the 187 taxon-impact cases recorded relate to this mechanism), structural impact on ecosystem (27.3%), and chemical impact on ecosystem (17.6%); none of the other mechanisms occurred in more than five cases. The three most frequently occurring mechanisms were also responsible for most of the maximum scores (Table 11, Fig. 17).

Table 11. Assessment of environmental impacts for invasive species for which data were available by using EICAT (Environmental Impact Classification for Alien Taxa; Blackburn et al. 2014). The maximal EICAT score recorded, the mechanisms to which the highest score refers (mechanisms of maximal impact) and other impact mechanisms exerted by the species are shown. References to papers in which the maximal scores are reported are given. EICAT scores: minimal concern (MC), minor (MN), moderate (MO), major (MR), massive (MV). Impact mechanisms identified for the species assessed: 1 – competition, 3 – hybridization, 6 – poisoning/toxicity, 9 – chemical impact on the ecosystem, 10 – physical impact on the ecosystem, 11 – structural impact on the ecosystem, and 12 – indirect impacts through interactions with other species.

Taxon	Maximal EICAT score	Mechanism of maximal impact	Other impact mechanisms	Reference
Ailanthus altissima	MR	1, 11	9	Uboni et al. 2019, Terzi et al. 2021
Ambrosia artemisiifolia	MO	1, 9, 11		Sărăţeanu et al. 2010, Qin et al. 2019
Arrhenatherum elatius	MR	1	11	Fiala et al. 2004
Asclepias syriaca	MR	3, 11	9	Dvirna 2018, Broyles & Elkins 2019
Bromus sterilis	MO	11	1	Salamon et al. 2011
Bunias orientalis	MO	1		Steinlein et al. 1996
Cirsium arvense	MO	1		Humber & Hermanutz 2011
Conyza canadensis	MR	1	11	Shah et al. 2014
Cuscuta campestris	MO	12		Lian et al. 2006
Echinops sphaerocephalus subsp. *sphaerocephalus*	MC	9, 11		Řezáčová et al. 2021
Erigeron annuus	MR	1, 11		Wang et al. 2020, Řezáčová et al. 2021
Fraxinus pennsylvanica	MR	1, 11		Schmiedel & Tackenberg 2013, Schmiedel et al. 2013
Helianthus tuberosus	MR	1	11	Filep et al. 2021
Heracleum mantegazzianum	MR	1, 9, 11	10	Hejda et al. 2009, Renčo et al. 2021
Impatiens glandulifera	MR	1, 11	9	Tanner et al. 2013, Bieberich et al. 2021
Impatiens parviflora	MO	1		Florianová & Münzbergová 2016
Juglans regia	MN	1		Loacker et al. 2007
Lupinus polyphyllus	MR	1, 11	9, 10	Ramula & Sorvari 2017, Hejda et al. 2021
Lycium barbarum	MR	11	1	Na et al. 2021
Pinus strobus	MR	9, 11	1	Hadincová et al. 2007, Podrázký & Remeš 2008
Populus ×canadensis	MV	3	11	Smulders et al. 2008
Prunus serotina	MR	1,9, 11	6	Halarewicz et al. 2017, Vegini et al. 2020, Godefroid et al. 2005
Quercus rubra	MR	1,9, 11		Chmura 2013, Gentili et al. 2019
Reynoutria japonica	MR	1, 9, 10, 11		Gerber et al. 2008, Mincheva et al. 2014, Woch et al. 2021
Reynoutria sachalinensis	MR	11		Topp et al. 2008
Reynoutria ×bohemica	MR	1, 11	9	Gerber et al. 2008, Fried et al. 2014
Robinia pseudoacacia	MV	11	1, 9, 12	Landgraf 2002, Chikowore et al. 2021
Rudbeckia laciniata	MR	1	11	Stefanowicz et al. 2017
Rumex alpinus	MR	1	9, 11	Handlová & Münzbergová 2006
Senecio inaequidens	MR	1		Vanparys et al. 2010
Setaria pumila	MO	1, 9		Tozer et al. 2008, Orlandi et al. 2017
Setaria viridis subsp. *viridis*	MO	9		Li et al. 2016
Sisymbrium loeselii	MO	6		Bainard et al. 2009
Solidago canadensis	MR	1, 9, 11	6	de Groot et al. 2007, Zhang et al. 2009, Řezáčová et al. 2021
Solidago gigantea	MR	1	9, 11, 12	Quist et al. 2014
Symphoricarpos albus	MR	1		Gilbert 1995
Symphyotrichum novi-belgii	MR	1		Hejda et al. 2021
Symphyotrichum ×salignum	MN	1		Glushakova et al. 2016
Telekia speciosa	MO	9, 11		Pergl et al. unpublished
Vulpia myuros	MO	1		Brown & Rice 2000

It needs to be noted that the EICAT classification is based only on documented direct effects of alien species in the literature (Hawkins et al. 2015). This rigorous and conservative approach causes even similar taxa like *Reynoutria japonica* and *R. ×bohemica*,

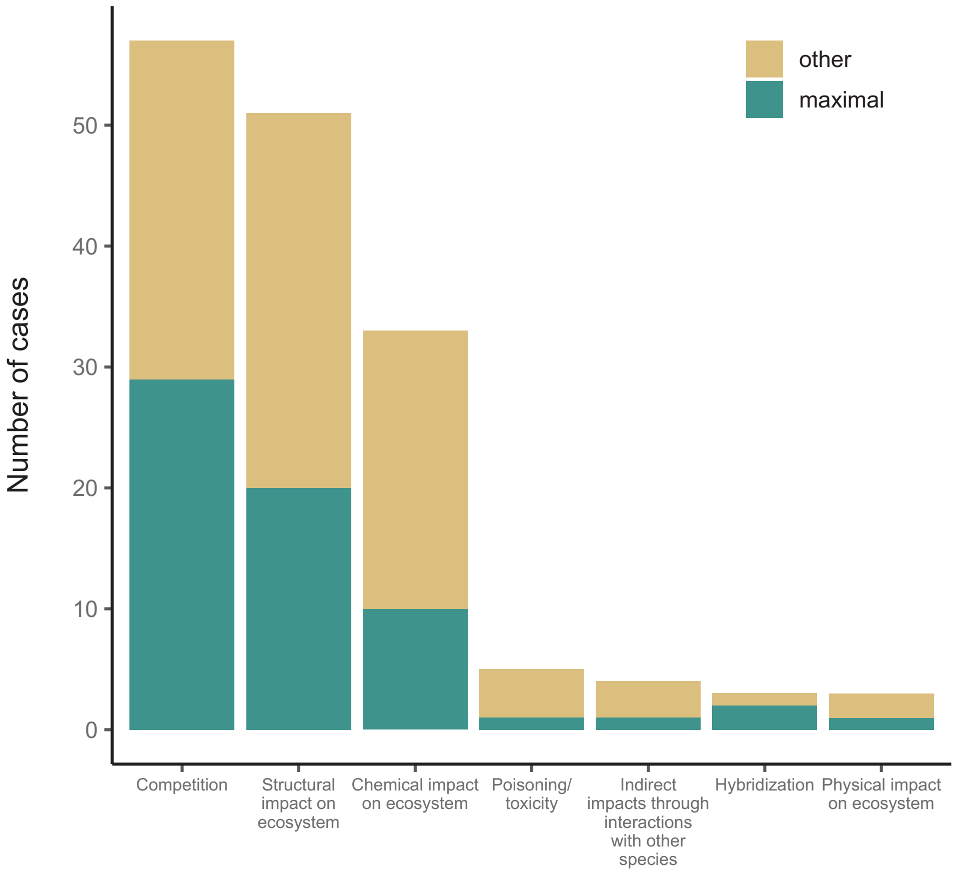


Fig 17. Frequency by impact categories, expressed as the number of occurrences of impact mechanisms per taxon. The green part of the bar represents the proportion of cases where the EICAT impact was the highest per taxon.

which can be assumed to generate the same impacts, to receive different scores for the reported impact mechanisms (Table 11). For many species, it is obvious that they have an impact on native species through competition (e.g. *Asclepias syriaca*), but the lack of studies did not allow us to reflect such impacts under the EICAT scheme. We are aware that known toxicity (*Senecio inaequidens* and *Juglans regia*) or physical impacts on ecosystems (*Pinus strobus* and *Quercus rubra*) are impacting invaded sites and co-occurring species, but to make the EICAT assessment presented here comparable across regions and taxonomic groups, these impacts are not translated into scores (Evans et al. 2016, Kumschick et al. 2017).

Studies from other parts of central Europe identified similar species with high impact. Rumlerová et al. (2016) used GISS scoring (Nentwig et al. 2016) and identified *Lantana camara*, *Eichhornia crassipes*, *Elodea canadensis*, *Crassula helmsii*, *Reynoutria japonica* and *Heracleum mantegazzianum* as the top six European invaders with highest environmental and socioeconomic impact. In another study conducted with EICAT (Lapin et al. 2021), which focused on riparian forest habitats, the strongest impacts were found for

Amorpha fruticosa, *Heracleum persicum*, *Humulus japonicus*, *Impatiens glandulifera*, and *Reynoutria* sp. In that study, the authors identified the strongest impacts due to competition or allelochemicals (mainly root exudates) causing local extinctions of other plants. None of these cases was classified in the highest category, where the impacts are assumed to be irreversible. Compared to Lapin et al. (2021), the assessment of the Czech invasive flora showed irreversible impacts due to hybridization in *Populus* taxa (Smulders et al. 2008) and due to chemical impacts on the ecosystem by *Robinia pseudoacacia* (nitrogen-fixing ability; Landgraf et al. 2005). Prioritizing alien taxa based on their impacts is the best basis for management when resources are limited, and there is a large pool of alien species. Sound impact assessment is also necessary for nature conservation and argumentation to the public when context-specific management is implemented (Foxcroft et al. 2013, Pergl et al. 2016b, Sádlo et al. 2017).

Policy overlap

Regulation (EU) No 1143/2014 of the European Parliament and of the Council on the prevention and management of the introduction and spread of invasive alien species, which came into force in 2014, has become a powerful tool for member states to support the management of invasive alien species (Genovesi et al. 2015). The key part of the regulation is the List of Invasive Alien Species of Union, which is being continuously updated. For the listed species, strict regulations apply (https://ec.europa.eu/environment/nature/invasivealien/list). Currently, the list is after the third update, and once it has become effective, it will include 88 species, of which 41 are plants. Of the 10 species from this list that are recorded in the Czech Republic, *Ailanthus altissima*, *Asclepias syriaca*, *Heracleum mantegazzianum* and *Impatiens glandulifera* are widespread species, for which detailed management measures have been elaborated; the same holds for the aquatic species *Elodea nuttallii*. The recent update of the catalogue includes three other species in the Czech Republic that are on the EU list: *Heracleum sosnowskyi*, *Myriophyllum aquaticum* and *M. heterophyllum* (see Appendix 1). These species and their sites have to be reported to the surveillance system of each member state, where they are recorded.

Conclusions

Information on the distribution of alien plants, largely based on studies of regional floras, have experienced an enormous boom and significant improvements in the last decade. This was made possible by an increasing amount of data that are readily available and shared, international collaboration networks (Packer et al. 2017), and the adoption of generally accepted terminological standards (Richardson et al. 2000, Blackburn et al. 2011), which allow different data sets to be compared. The distribution of alien species is documented with increasing level of precision and reliability based on a variety of sources, including specialized checklists relying on the local knowledge and accumulated historical data and large databases (van Kleunen et al. 2019, GBIF 2022) that are being integrated into comprehensive information systems (Seebens et al. 2020). Although the quality of such sources has been shown to vary in the past (Hulme & Weser 2011), it has been improving through continued efforts. Journals specializing in biological invasions represent an additional source of quality data. For example, the series on alien floras in Biological

Invasions launched four years ago (Pyšek et al. 2018) has now yielded ~20 carefully elaborated accounts on regional alien floras or faunas, some of them in understudied parts of the world (https://www.springer.com/journal/10530/updates/17247530). With the present publication, the Czech Republic follows this trend.

The Czech Republic has been at the forefront of these efforts in the last 20 years as one of the first countries globally to start the systematic categorization and monitoring of its alien flora. Since the first edition of the Catalogue of alien plants of the Czech Republic, the data have become open access and contributed to the mainstream activities in plant invasion research. The first edition (Pyšek et al. 2002), included in the DAISIE database, contributed to the knowledge of invasions at the European scale (Lambdon et al. 2008) and beyond (Fridley 2013). The second edition (Pyšek et al. 2012b) made a global impact mainly through GloNAF (Pyšek et al. 2017b). Here we present the most recent update; the data are made freely available and integrated into the Pladias database (Chytrý et al. 2021), which makes them ready to use by researchers, conservationists, and managers.

Continuous update of information on regional alien floras is important to monitor alien species introductions, their dynamics over time (Seebens et al. 2017, 2021), and potential threats imposed on native ecosystems by alien species that are yet to arrive (Pergl et al. 2016a, Roy et al. 2019). Moreover, regular updates on aliens in the same region provide insight into the dynamics of species success or failure, as the survival, establishment, and spread of particular taxa can be assessed over time.

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Supplementary materials

Table S1. – Occurrence of naturalized alien taxa in the Czech Republic in habitats classified to SynHab categories (see Methods for details on habitat categories).
Table S2. – Introduction pathways for alien taxa in the Czech Republic (see Methods for details on pathway classification).
Table S3. – List of alien taxa of the Czech flora.

Supplementary materials are available at www.preslia.cz

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Katalog nepůvodní flóry České republiky (3. vydání) – druhové bohatství, status, rozšíření, stanoviště, regionální invadovanost, způsob zavlečení a impakt

Předkládáme třetí vydání Katalogu nepůvodních rostlin České republiky, které navazuje na vydání z let 2002 a 2012. Katalog byl aktualizován o nové údaje shromážděné v posledním desetiletí; byl též přehodnocen status některých taxonů na základě nových taxonomických a ekologických poznatků, včetně nedávno vytvořené databáze flóry a vegetace ČR Pladias a Archeobotanické databáze ČR. Všechny změny v zařazení taxonů oproti verzi z roku 2012 jsou zdokumentovány a vysvětleny v Apendixu 1. Katalog zahrnuje 1576 nepůvodních taxonů s informacemi o jejich taxonomickém zařazení, životní formě, geografickém původu, době zavlečení (archeofyt, neofyt), stadiu invaze (dočasně zavlečený, naturalizovaný, invazní), datu prvního a posledního terénního záznamu, rozšíření v ČR, způsobu zavlečení, stanovišti a hodnocení impaktu. Oproti vydání z roku 2012 došlo k nárůstu o 122 taxonů; 157 bylo nově doplněno a 35 odstraněno, protože některé byly překlasifikovány na původní, pro jiné se ukázalo, že nejsou dostatečné podklady podporující setrvání na seznamu. Nepůvodní flóra zahrnuje 630 rodů a 122 čeledí; 385 taxonů jsou archeofyty a 1191 neofyty. Většinou se jedná o taxony přechodně zavlečené (1084, tj. 68,8 % z celkového počtu), 417 taxonů je naturalizovaných (26,4 %) a 75 invazních (4,8 %). Příspěvek nepůvodních taxonů ke květeně ČR činí 37,8 %, pokud jsou zohledněny všechny taxony bez ohledu na stádium invaze, nebo 16,2 %, uvažujeme-li pouze naturalizované, které jsou trvalou součástí květeny. Počty taxonů v čase rostou u všech skupin vymezených podle stadia invaze. Nejvíce nepůvodních rostlin pochází ze Středomoří (618 taxonů, tj. 31,5 % z celkového počtu), ostatních částí Evropy (380 taxonů, 19,4 %), ostatních částí Asie (290 taxonů, 14,1 %) a Severní Ameriky (262 taxonů, 13,4 %). Největší počet invazních taxonů (27, což odpovídá 27,6 % všech invazních archeofytů a neofytů) pochází ze Severní Ameriky. Počet obsazených polí síťového mapování o velikosti 10 × 6 minut se zvyšuje se stadiem invaze a s dobou od zavlečení. Invazní taxony jsou přítomny ve větším počtu polí než naturalizované a přechodně zavlečené a archeofyty jsou rozšířenější než neofyty. Mapy založené na kumulativním výskytu nepůvodních druhů za posledních 50 let, vyjádřeném jako podíl na flóře příslušného kvadrantu mapovacího pole, ukazují, že nepůvodní druhy jsou relativně častější v nížinách a v městských aglomeracích. V evropském srovnání je Česká republika v současné době středně invadovanou zemí.

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Appendix 1. Summary of changes made in this paper in comparison with the 2nd edition of the catalogue (Pyšek et al. 2012b). The changes (marked →) are arranged into sections representing (i) new taxa recorded since the previous edition, (ii) change in the residence time status (archaeophyte – ar; neophyte – neo), (iii) change between the categories of invasion status (casual – cas; naturalized – nat; invasive – inv), (iv) change in the taxon name based on taxonomic development, and (v) taxa that were removed from the previous edition because they were reclassified as native, are not escaping from cultivation, taxonomically not justified or were previously included based on doubtful records. Taxa within each section are arranged alphabetically. The following sources are abbreviated: KČR 1 – Hejný & Slavík 1988, KČR 2 – Hejný & Slavík 1990, KČR 3 – Hejný & Slavík 1992, KČR 4 – Slavík 1995, KČR 5 – Slavík 1997c, KČR 6 – Slavík 2000, KČR 7 – Slavík & Štěpánková 2004, KČR 8 – Štěpánková 2010, KČR 9 – Štěpánková 2023; CZAD – https://web.arup.cas.cz/czad, Dreslerová & Pokorná 2015; Pladias – https://www.pladias.cz.

NEW TAXA (157)

Acaena microphylla (→ neo cas) is a low creeping perennial endemic to the North Island of New Zealand and grown as an ornamental (Yeo 2011). The first escaped occurrence was recorded by Domin (1949) in the town of Mariánské Lázně in western Bohemia. In 1947, he observed a few large patches of this species downtown in abandoned rock gardens. In 2021, a large clonal population was found in the village of Dolní Světlá in northern Bohemia. Plants grown in private gardens have spontaneously spread to garden lawns and from there to disturbed grassy sites in public spaces (Sádlo in Lustyk & Doležal 2022).

Adiantum capillus-veneris (→ neo cas) is globally widespread in tropical and warm-temperate regions, in Europe especially in the Mediterranean Basin and in areas with oceanic climates. In the Czech Republic, it is cultivated as an indoor ornamental plant and sometimes escapes in glasshouses. Several dozen plants, some of them fertile, were recorded in 2022 in joints of walls in cellar niches of a house in the town of Nové Město nad Metují in eastern Bohemia. Due to increasingly mild winters, further outdoor escapes of this species can be expected (Ekrt in Lustyk & Doležal 2022).

Aira elegantissima (→ neo cas) is native mainly to the Mediterranean area and the adjacent parts of south-western Asia (Conert 1998, Bolòs & Vigo 2001). It was recorded as escaped from cultivation in the town of Jirkov in north-western Bohemia in 1853 and at a railway station in the city of Olomouc in central Moravia in 1941 (Kaplan in Lustyk & Doležal 2020).

Allium caeruleum (→ neo cas) is native to central Asia. In Europe, including the Czech Republic, this species is cultivated as an ornamental and is commonly available on the market. In 2017, about 60 flowering specimens were found in a cutting of an industrial railway near the village of Rohatec in south-eastern Moravia. Most plants had bulbils in inflorescences, which makes further spread at the site rather easy (Uher in Lustyk & Doležal 2019).

Allium fuscum (→ neo cas) is native to the Balkan Peninsula. In 2013, about 10 flowering individuals were observed in an abandoned garden in Brno's city district of Husovice. The population was destroyed in 2017 due to building activities (Krahulec & Sádlo in Lustyk & Doležal 2020).

Alopecurus rendlei (→ neo cas) is native mainly to the Mediterranean area and Atlantic western Europe. It occurs mainly in wet, sometimes saline meadows, on roadsides and in waste places (Clarke 1980). It was collected by M. Deyl in 1936 and 1937 in a waste place in the village of Troja, now part of Prague (Bureš & Danihelka in KČR 9).

Althaea taurinensis (→ neo cas), native to the eastern Mediterranean area, is sometimes cultivated as a medicinal plant. It was first collected in 1857 near the village of Dolní Věstonice in southern Moravia. Since then, it has been recorded in other 12 grid-cell quadrants. It is found mainly on pond shores and river banks and in ditches as escaped from cultivation (Hroneš & Király in Kaplan et al. 2019a, Hroneš in Pladias, Hroneš in Lustyk & Doležal 2022).

Amaranthus ×ralletii (→ neo cas; *A. bouchonii* × *A. retroflexus*) was collected at three sites in central and northern Bohemia in 2005 and 2015. The two more recent records are from gravel and sand bars of the Labe river near the town of Děčín in northern Bohemia (Letz in Lustyk & Doležal 2019).

Amaranthus ×ozanonii (→ neo cas; *A. hybridus* × *A. retroflexus*). Based on the opinion of Letz (in Lustyk & Doležal 2019), a plant corresponding to this hybrid combination is a new taxon for the flora of the Czech

Republic because this name was used incorrectly in the past. The plant was collected in 1966 in the town of Železný Brod in northern Bohemia as introduced with cotton spinning mill waste. Until recently (Jehlík in KČR 2, Danihelka et al. 2012, Pyšek et al. 2012, Kaplan et al. 2019a), this name was used for hybrids between *A. powellii* and *A. retroflexus* (see section Change of name/Reidentification: *A.* ×*soproniensis*).

Amaranthus emarginatus* subsp. *emarginatus (→ neo nat) was first collected in the Czech Republic from a small sandy island in the middle reservoir of the Nové Mlýny cascade on the Dyje river in southern Moravia in 1994. In 2013 and 2015, it was found at two sites on the Morava river downstream of the town of Hodonín (Dřevojan & Letz 2016). Despite the small number of records, this subspecies is probably locally established on the lower Dyje and Morava rivers. Its occurrences are restricted to sandy deposits in the river bed.

Amaranthus emarginatus* subsp. *pseudogracilis (→ neo nat) was first collected in the Czech Republic in 1983 in the village of Šakvice in southern Moravia. Since then, six additional records from the lower Dyje and Morava rivers and one from the bank of the Oslava river near the village of Čučice in south-western Moravia have been reported (Dřevojan & Letz 2016). This subspecies is also locally established in southern Moravia. It is less strongly associated with alluvial deposits and rarely occurs also in temporarily wet ruderal habitats.

Aquilegia flabellata (→ neo cas), native to eastern Asia, is grown as an ornamental, especially in rock gardens. It was collected as escaped on a disturbed roadside in the village of Šebrov near the town of Blansko in central Moravia in 2013 (Chytrá & Chytrý in Hadinec & Lustyk 2014). However, it was not observed at the same site recently.

Aralia cordata (→ neo cas) is native to south-eastern China, Taiwan, Korea and Japan. A dense stand of this species, probably a cultivation relict, was found in 2020 near an abandoned swimming pool in the town of Česká Třebová in eastern Bohemia (Lustyk in Lustyk & Doležal 2022).

Aristolochia macrophylla (→ neo cas), native to the eastern part of North America, is infrequently grown as an ornamental. Spontaneous stands of this liana were recorded in Prague on a railway embankment in 1994 (Sádlo in Pladias) and in a scrubby grove along a stream near the town of Čáslav in 2005 (Marek in Pladias). The spread of this species by seed has not been observed in the Czech Republic so far; the occurrences probably arose from cut branches that took root.

Asparagus verticillatus (→ neo cas) is native to south-eastern and eastern Europe and western Asia. It is a dioecious climber cultivated in botanic gardens and sometimes, but with increasing frequency, also as an ornamental. In 2017, escaped fruiting plants were found on a steep rocky slope above the Rokytná river near the village of Budkovice in south-western Moravia and near the village of Úvaly in southern Moravia; no connection to cultivated specimens could have been established for these finds (Danihelka et al. 2017b). However, plants of *A. verticillatus* escaped from an adjacent garden were observed near the town of Znojmo in southern Moravia already in 2009 (Němec in Lustyk & Doležal 2021).

Astragalus sulcatus (→ neo cas) has an extensive range in continental parts of Eurasia. A small population of this species was discovered in 2016 on the grassy slopes of a railway cutting above the northern edge of the village of Újezd u Brna in southern Moravia (Danihelka & Sedláček 2017).

Blumenbachia hieronymi (→ neo cas), native to Argentina and rarely cultivated as an ornamental, was observed escaping from cultivation in Prague in the botanical garden of the Czech University and at another site in the city between 1912 and ~1917 (Domin 1918). However, no herbarium specimens supporting this record have been found at PRC, where the majority of Domin's collections are preserved (M. Štefánek 2022 in litt.).

Bowlesia incana (→ neo cas) is native to the warm temperate part of the Americas. It is recorded as alien in Spain, France, Germany and Sweden (Hand 2011), Pakistan, South Korea and New Zealand (Kang et al. 2020). It was observed escaping from cultivation in the botanical garden of the Czech University in Prague and the village of Braník, now part of the city of Prague (Domin 1918). The former record is documented by undated specimens at PRC (M. Štefánek 2022 in litt.). At both sites, it occurred as a weed in beds with vegetables. This record remained neglected until now.

Bromus bromoideus (→ neo cas) is a highly specialized weed of spelt fields (*Triticum aestivum* Spelta group) endemic to the provinces of Liège and Luxemburg in Belgium and to the adjacent French department Ardennes. A single specimen of this species was collected in 1889 in the city of Olomouc on a rubble heap (Danihelka in Hadinec & Lustyk 2014, Chrtek & Danihelka in Kaplan et al. 2022). Seeds of *B. bromoideus* may have been introduced with forage grain for horses, but no evidence is available.

Broussonetia papyrifera (→ neo cas) is native to India, China, Japan and south-eastern Asia. It is widely cultivated elsewhere for bark fibres used for making paper, for wood used in the timber industry and as a medicinal plant (Wu et al. 2003). It has become naturalized or even invasive in several parts of the world, including southern Europe (Uotila 2011–). In 2002, one plant was recorded as escaped from a garden near the town of Nymburk in central Bohemia (Jar. Rydlo in Rydlo 2003).

Cardamine occulta (→ neo nat) is native to eastern Asia. The earliest record of this species in Europe is from northern Italy in 1977. It started to spread in the 2000s, and recently it has been known in many European countries (Marhold et al. 2016, Ducháček et al. 2020). In the Czech Republic, *C. occulta* was collected for the first time in 2002 (or reportedly in 2001) as a weed in a flower bed in front of a house in Prague's district of Nové Město, but misidentified as *C. flexuosa* and reidentified only recently (Marhold & Ducháček in Hadinec et al. 2021). Since 2006 *C. occulta* has been observed in garden shops and centres as a weed in pots with ornamental plants, and later also as a weed in various places in garden shops, botanical gardens, flower beds and containers with ornamental plants in towns and cemeteries, forest nurseries and on exposed fishpond bottoms (altogether ca 25 localities in 2020; Ducháček et al. 2020).

Caryopteris ×clandonensis (→ neo cas) has been frequently planted as an ornamental in the Czech Republic since the 1990s. It is a hybrid derived from the combination *C. incana* × *C. mongholica*, first found in England in the early 1930s. Nowadays, about 18 cultivars exist (Miller 2007). In 2019, ~10 plants, some of them flowering, were found at the southern periphery of the village of Rozdrojovice, north-west of the city of Brno. Saplings were also found at other places in Brno where this species is cultivated (Danihelka et al. 2020a). Further records are likely to follow.

Centaurea bruguiereana* subsp. *belangeriana (→ neo cas) is native to south-western Asia from Iran to south-eastern Uzbekistan. In 1974, eight plants of this taxon were found in the port on the Labe river in the town of Lovosice in northern Bohemia (Jehlík 2013, Koutecký 2015, Koutecký in Hadinec & Lustyk 2016, Koutecký in Kaplan et al. 2018b).

Centaurea jacea* × *C. nigrescens* × *C. oxylepis (→ neo cas) The occurrence of this hybrid is restricted to sites where all three species co-occur (Koutecký 2008).

Centaurea jacea* × *C. transalpina (→ neo cas). This hybrid was recorded in 2015 near the village of Purkarec in southern Bohemia (Koutecký in Hadinec & Lustyk 2016).

Centaurea stoebe* subsp. *australis (→ neo nat) is native to southern Europe, and as an alien taxon, it occurs throughout Europe and in North America. In the Czech Republic, the earliest herbarium specimen is from 1896, and most of the records come from the last ~50 years. Recently it is scattered throughout the country (recorded in 111 grid-cell quadrants), occurring mostly along railways, less often on roadsides and in stone quarries; it is rare in semi-natural vegetation (Otisková et al. 2014, Koutecký & Mráz in Kaplan et al. 2018b).

Centaurea weldeniana (→ neo cas) has a small distribution range along the north-eastern coast of the Adriatic Sea from eastern Italy to northern Greece. It was collected in 1946 in the Český kras karst area in central Bohemia (Koutecký in Hadinec & Lustyk 2016, Koutecký in Kaplan et al. 2017a).

Cephalaria transsylvanica (→ neo cas) is native to southern, central-eastern and south-eastern Europe, southernmost Ukraine, the Don river basin and the Caucasus In 2016, a single specimen was observed at a railway station in the town of Borohrádek in eastern Bohemia. Seeds were introduced with bauxite from Montenegro (Doležal in Hadinec & Lustyk 2017).

Cerastium subtetrandrum (→ neo inv) occurs locally in saline vegetation (mainly in grazed seashore meadows) in southern Scandinavia, on the Baltic islands of Öland and Gotland, possibly also in Poland along the Baltic coast and further in inland saline habitats of southern Slovakia, eastern Austria, western Hungary and north-western Serbia (Jonsell et al. 2001, Letz & Dřevojan 2018). It is now spreading in central Europe along motorways on road verges treated with deicing salt. In the Czech Republic, it was first recorded in 2017 on the motorway D5 near the village of Mlýnec in western Bohemia (Danihelka et al. in Kaplan et al. 2020). Since then, *C. subtetrandrum* has been found in further seven grid-cell quadrants.

Chaenorhinum origanifolium (→ neo cas) is native to the western Mediterranean area, where it occurs mainly in the crevices of limestone rocks. It is sometimes cultivated as an ornamental. Escaped plants were recorded in several European countries with oceanic climates. In 2005, this species was first observed in the Czech Republic in the abandoned limestone quarry Skalky near the town of Štramberk in north-eastern Moravia, where the plants were most likely deliberately planted. In 2013, the population consisted of more than 100 plants, and the species has further spread within the quarry (Kocián & Kocián 2013).

Chenopodium giganteum (→ neo cas) is native to northern India, where it was cultivated as a cereal. Nowadays, it is cultivated worldwide, usually as a leaf vegetable and as an ornamental. Seeds of this species are commercially available also in the Czech Republic. Escaped plants are recorded rather frequently, but they usually do not spread and disappear after several years. In 2004–2019, escaped plants occurred in Průhonice and Prague at three different sites. At two sites, they escaped from cultivation, while the occurrence on one of the islands in the Vltava river in Prague was on alluvial deposits after severe floods (Mandák & Marek in Lustyk & Doležal 2020).

Chloris divaricata (→ neo cas) is native to Australia (Nightingale et al. 2005). In Europe, it has been recorded at four sites in Switzerland and Germany (Conert 1998). It was collected in 1959–1960 in the city of Brno in gardens fertilized with waste from wool sorting and cleaning (Kaplan in Hadinec & Lustyk 2014), but previously not recognized from specimens reported as *C. truncata* (Dvořák & Kühn 1966).

Chloris pectinata (→ neo cas) is native to Australia (Nightingale et al. 2005). Two specimens of this species have been found and identified in herbaria during a revision of alien grasses introduced to the Czech Republic (Kaplan in Hadinec & Lustyk 2014). They were collected in 1959 in the city of Brno in gardens fertilized with waste from wool sorting and cleaning, and tentatively identified by J. Dvořák as *C. acicularis*, but this find remained unpublished.

Clarkia amoena (→ neo cas) is native to western North America. In Europe, this species is sometimes cultivated as an ornamental. A small population was observed in 2007 at a ruderal site in the village of Křemže in southern Bohemia but disappeared by the next year (M. Lepší in Lepší & Lepší 2019, Lepší in Lustyk & Doležal 2021).

Cleome hassleriana (→ neo cas) is native to South America from Brazil to northern Argentina and has become naturalized in other tropical and subtropical regions. In Europe, it is increasingly planted as an ornamental and occasionally escapes from cultivation. In the Czech Republic, it was observed in 2012 near the village of Čejkovice in southern Moravia and in 2015 on gravel deposits of the Labe river in the town of Děčín in northern Bohemia (Uher in Hadinec & Lustyk 2016).

Cochlearia danica (→ neo inv) is native to saline coastal habitats of western and northern Europe. Recently, it has spread rapidly along roads and motorways, especially in Great Britain, Belgium, France, Germany, Austria and Hungary. In the Czech Republic, it was first recorded in 2016 at four localities in central, western, northern and eastern Bohemia, in narrow strips on verges of roads and motorways and in central reservations of motorways (Ducháček et al. 2017, Ducháček et al. in Kaplan et al. 2018a). Since then, *C. danica* has been found in additional 46 grid-cell quadrants, sometimes forming large and dense stands. Its further spread is very likely.

Conyza sumatrensis (→ neo cas) is native to the tropical and subtropical zones in the Americas. It has been introduced to the Mediterranean Basin, western Europe, Africa, India and south-eastern Asia. In the Czech Republic, *C. sumatrensis* was observed at three sites in the central parts of Prague and at one site in Prague's outskirts of Troja (Sádlo in Lustyk & Doležal 2021).

Cornus alba (→ neo nat). This shrub, native from Siberia to Korea, is cultivated, escapes and spreads clonally and by seed. It has become naturalized to about the same extent as the previously reported *C. sericea*. It was not known as an escaped species until the end of the 20th century (Holub in KČR 5), and its spread only started in the 2000s. Unfortunately, in most records, it is impossible to distinguish between cultivated individuals, remnants of former cultivation and truly escaped individuals. At present, large spontaneous populations are growing, e.g., in the outskirts of Prague and in many places in the surroundings of the city of Ostrava in the north-east of the country.

Corydalis cheilanthifolia (→ neo cas) is native to south-western and central China. In Europe, it was first recorded in 1918 in Brussels. Currently, the species is known from England, where it is naturalized, and from the Netherlands, Belgium and France. In the Czech Republic, it was found escaped in joints of walls in the towns of Boskovice in central Moravia (2012) and Krupka in northern Bohemia (2021). In 2015, it escaped or was deliberately planted and propagated by seed at several sites near an old millrace in a floodplain forest on the outskirts of the town of Břeclav in southernmost Moravia (Uher 2016, Prančl in Kaplan et al. 2022).

Cotoneaster hjelmqvistii (→ neo cas), native to northern and eastern China and grown as an ornamental in central and western Europe, has often been confused, e.g., under the vernacular name *C. horizontalis* 'Robusta'.

This shrub has escaped from cultivation in Germany, France, Belgium, Great Britain and Scandinavia (Verloove 2011a). One escaped specimen was found in a pine forest near the village of Holubov in southern Bohemia (P. Lepší 2016 CB).

Cotoneaster multiflorus (→ neo cas), described from Kazakhstan, is a deciduous species native to central-Asian countries, northern China and northern Mongolia. In central Europe, this species or some closely related taxa (*C. affinis*, *C. racemiflorus* and *C. roseus*) are rather frequently planted in public spaces in settlements. Escaped plants were recorded, for instance, in Germany (Dickoré & Kasperek 2010). In the Czech Republic, escaped specimens were found in forests near the village of Ostopovice (O. Rotreklová 2013 BRNU, det. J. Koblížek) and in the city of Brno, city district Kohoutovice (T. Wirth 2014 BRNU), both in southern Moravia. The exact identity of cultivated specimens and escaped plants require further study.

Cotoneaster splendens (→ neo cas) is native to the mountains of central and southern China. In the Czech Republic, it is rarely cultivated in botanical gardens and arboreta. This species was found in 2021 in the city of Brno, city district Líšeň, in southern Moravia, probably escaped from a nearby cemetery (Řepka in Lustyk & Doležal 2022).

Cotula coronopifolia (→ neo cas) is native to southern Africa and has become naturalized in other parts of the world. It was found in 2010 on a drained fishpond bottom near the village of Sudoměř in southern Bohemia (Kúr in Hadinec & Lustyk 2014).

Crepis pulchra (→ neo cas) is native to southern Europe, south-western and western-central Asia and north-western Africa. It was collected in 2021 at the railway station in the town of Duchcov in northern Bohemia, in Prague's city district of Žižkov, along the railway in the village of Sedlec and on a dry slope near the town of Valtice in southern Moravia (Hubatka & Lustyk in Lustyk & Doležal 2022).

Cyclospermum leptophyllum (→ neo cas) is native to Central and South America and probably also to the tropics and subtropics of Africa. It has been introduced to Europe, especially its southern part, but is also reported from its central and northern parts. In 2015, a single plant was found on gravel deposits of the Labe river in the town of Děčín in northern Bohemia. The origin of this occurrence is unknown; most likely, it resulted from ship transportation (Ducháček et al. in Lustyk & Doležal 2018).

Cyperus congestus (→ neo cas) is a robust, short-lived perennial sedge native to southern Africa. It has been introduced to Europe, mostly with imported wool, and also to other parts of the world. It has become naturalized in Spain, Italy, Japan and Australia. Recently, it is also cultivated as an ornamental (Verloove 2014). In 2009, this species was collected in the village of Průhonice, probably as a garden escape (P. Lepší 2009 CB, det. F. Verloove).

Cyperus difformis (→ neo cas) is native to the tropics and subtropics of the Old World. It was found in 1960 in a cotton mill in the town of Frýdlant in northern Bohemia (Kubát in KČR 9).

Delphinium grandiflorum (→ neo cas) is a short-lived perennial native to Siberia and the continental parts of eastern Asia. In Europe, it is sometimes cultivated as an ornamental. A single escaped plant was observed in 2016 on a road in the village of Poštorná, part of the town of Břeclav, in southern Moravia (Uher in Lustyk & Doležal 2020).

Dicentra formosa (→ neo nat), native to western North America, is grown as an ornamental and only recently recorded escaped. So far, it has been found at only four sites, each of them harbouring populations of up to hundreds of plants growing in natural forest habitats (Mikoláš in Hadinec & Lustyk 2016, Doležal & Novák in Lustyk & Doležal 2021). *Dicentra formosa* spreads by rhizomes and seeds and is myrmecochorous (Barnes 1976). The easy spread of the species is indicated by internet data from Czech hobby gardeners, according to which it is easily propagated from seed in gardens, including self-seeding.

Dichondra argentea (→ neo cas) is native to the south-western USA, Mexico and some parts of South America. Recently, it has become a popular ornamental plant in trade referred to as 'Silver Falls'. One flowering and fruiting plant was found growing in a joint at the foot of a wall in the village of Smržovka in northern Bohemia in 2018. At the same site, escaped plants were also observed in three subsequent years (Zdvořák in Lustyk & Doležal 2019). Escaped individuals were also found in pavement joints under a balcony where this species was cultivated, in Prague's city suburb of Šeberov in 2020 (K. Štajerová in herb. Z. Kaplan).

Dracocephalum parviflorum (→ neo cas) is native to North America (USDA, NRCS 2020). It has been introduced into several European countries including Belgium, Germany, Poland and Austria. In the Czech Republic, one specimen of *D. parviflorum* was collected in the town of Pec pod Sněžkou in the Krkonoše Mts in 1928, which is the only record of this species in this country. The specimen was erroneously identified as *Galeopsis ladanum*, and only recently, it was reidentified as *D. parviflorum* (Danihelka 2019, Danihelka in Kaplan et al. 2021). The mode of accidental introduction of this species is unknown.

Eclipta prostrata (→ neo cas) is native to warm temperate and tropical areas of the Americas and naturalized in southern Europe, south and south-eastern Asia, Africa and Australia. It was found in 2021 as a weed in two garden centres in the southern part of Prague and in a garden centre in the village of Brněnské Ivanovice in the city of Brno. It may have been introduced with potted plants imported from the Netherlands (Doležal & Řepka in Lustyk & Doležal 2022).

Echinacea purpurea (→ neo cas), native to the eastern part of North America, is widely cultivated for its ornamental and medicinal benefits. It often spreads by seeds in private gardens and their close surroundings, e.g. in Prague, the town of Špindlerův Mlýn in north-eastern Bohemia and the village of Dolní Světlá in northern Bohemia. This species has been recorded as escaping from cultivation in Slovakia (Medvecká et al. 2012). In 2015, a population of differently aged plants from self-seeding was observed in the city district Brno-Komín in a ruderal area in an abandoned gardening colony (Sádlo & Petřík in Pladias).

Echinops bannaticus (→ neo cas) is native to the Balkan Peninsula. In Europe, this species is planted as an ornamental and escapes from cultivation. In the Czech Republic, it was collected for the first time in 1888 near the city of Brno in southern Moravia. Since then, *E. bannaticus* has been recorded across the country in 22 additional grid-cell quadrants (Koutecký in Kaplan et al. 2019b).

Eleusine coracana* subsp. *coracana (→ neo cas) is an allotetraploid cultural plant with a long historical record of cultivation dating back at least 5000 years in Africa and 3000 years in India (Hilu 2003). It was collected in 2000 in a transit shed at the river port of Nové Loubí at the Labe river north of the town of Děčín in northern Bohemia (Kaplan in Hadinec & Lustyk 2014).

Eleusine tristachya (→ neo cas) is native to tropical South America. It was found escaped in 1964 on waste ground in the city of Brno and in 1989 and 1991 on an experimental plot of the Research Institute for Fodder Crops in the village of Troubsko near Brno in southern Moravia (Kaplan in Hadinec & Lustyk 2014).

Elymus obtusiflorus (→ neo cas) is native to south-eastern Europe and south-western Asia and has been introduced to several south-western- and central-European countries. In Germany, it was used for slope and soil stabilization and spreads by road traffic. A single tussock of this species was collected in 2020 on a roadside in the town of Chlumec nad Cidlinou in eastern Bohemia (Ducháček & Doležal in Lustyk & Doležal 2021).

Epilobium brachycarpum (→ neo nat), native to the western part of North America, was first recorded in the Czech Republic in 2016 between the villages of Svatava and Citice near the town of Sokolov in western Bohemia. Many stands numbering up to hundreds of plants grew around railway tracks, at railway stations and marshalling yards (Salák & Hadinec in Hadinec & Lustyk 2017, Danihelka in Kaplan et al. 2018a). Since then, *E. brachycarpum* has been recorded in six additional grid-cell quadrants, and we consider the species as locally naturalized. It may soon become invasive.

Epimedium ×perralchicum (→ neo cas; *E. perralderianum* × *E. pinnatum* subsp. *colchicum*) is a hybrid that originated in cultivation and is sometimes cultivated as an ornamental. It was collected in 2014 and 2016 near the village of Hlohovec in southern Moravia (Uher in Lustyk & Doležal 2020).

Eriochloa villosa (→ neo cas) is native to eastern Asia. It was found at the edges of arable fields south-east of the village of Šatov near the town of Znojmo in south-western Moravia in 2013 (Paulič & Němec 2014).

Erodium manescavii (→ neo cas) is a perennial native to the central and western Pyrenees in Spain and France. It has showy violet flowers; therefore, it is sometimes cultivated as an ornamental. Records of escaped plants exist from Great Britain, Belgium, Germany and Austria. In 2016, two flowering plants surrounded by a dozen of seedlings were found in the town of Rychnov nad Kněžnou in eastern Bohemia (Doležal in Lustyk & Doležal 2020).

Euphorbia nutans (→ neo cas). A single young specimen of this species was collected in the village of Zálabí, part of the town of Kolín in central Bohemia, in the yard of the Soja factory (V. Jehlík et al. 1981 PR), where it was introduced as a contamination of soya beans. The specimen was correctly identified, but the record was not published. The taxonomic identity of the specimen was recently confirmed by M. Ducháček. The second record is from 2022, when one plant was found at the Borohrádek railway station in eastern Bohemia, possibly introduced with bauxite from Montenegro or Bosnia and Herzegovina (Danihelka et al. in Kaplan et al. 2023).

Euphorbia prostrata (→ neo cas) was first recorded in the Czech Republic in the marshalling yard Ostrava–Mariánské Hory in 2013 (Hlisnikovský in Hadinec & Lustyk 2014) and the city of Olomouc. Since then, there have been additional records from Prague's city district of Horní Počernice and the city of Olomouc (Šumberová et al. in Lustyk & Doležal 2019). The occurrences of this species are still restricted to specific habitats in cities (mainly pavement joints and places covered with fine gravel), but the number of records is growing.

Euphorbia saratoi (→ neo nat) was collected in the Czech Republic for the first time in disused limestone quarries near the village of Grygov in central Moravia a century ago (Otruba 1921 BRNU) but misidentified as *E. esula* × *E. virgata*. Based on this specimen, Podpěra described this putative hybrid as *E.* ×*intercendens*. The population at the Grygov site (no more extant) may have been fairly abundant because plants from this site were issued as no 430 of the Flora exsiccata Reipublicae bohemicae slovenicae. The identity of these plants was recognized only recently, based on morphological characters and supported by flow cytometry measurements (relative genome size corresponds to the hexaploid level). This species, native probably to eastern Europe, is scattered all over the Czech Republic in ruderal habitats, mainly along railways and roads, and reported from 95 grid cells (Danihelka et al. in Kaplan et al. 2023).

Euphorbia serpens (→ neo cas). A large population of this species was first observed in 2017 in the Old City of Prague in pavement joints at the quay of the Vltava river (Sádlo in Lustyk & Doležal 2018). It was probably introduced to that place with palm trees cultivated there in containers over the summer. The population, dispersed over about 40 m^2 in 2017, still persists at the site, but there have been no additional records since then.

Festuca arundinacea* × *Lolium multiflorum*, ×*Festulolium braunii (*Festuca pratensis* × *Lolium multiflorum*; both taxa → neo nat). As stated by Šmarda & Grulich (in Kaplan et al. 2019a), intergeneric hybrids between *Festuca arundinacea*, *F. pratensis* and *Lolium multiflorum* (including their backcrosses) tend to be sown in meadows; they are fully fertile and may escape. Hybrids of the *F. pratensis* agg. and *Lolium* spp. are referred to in agricultural practice by the common name *Festulolium*. According to Fojtík (1994), they have been commonly grown since the 1990s in monocultures or sown in meadows and pastures. The Pladias database does not contain records of these taxa; still, spontaneous occurrences of some taxa of this group are mentioned, e.g. by Vojík et al. (2020).

Fibigia clypeata (→ neo cas) is a small perennial native to the Mediterranean area and western Asia. It is sometimes cultivated for inflorescences, which are used in dry bouquets. In 2017 and 2019, escaped plants were recorded near the village of Hostim in central Bohemia and in the town of Rájec-Jestřebí in central Moravia, respectively (Láníková in Lustyk & Doležal 2020).

Galanthus elwesii (→ neo cas) is native mainly to the Balkan Peninsula and Anatolia. It is sometimes cultivated as an ornamental. Escaped plants were first recorded on Petřín hill in Prague's city district of Smíchov in 2007 and near the village of Branka near the city of Opava in Silesia in 2015. At the first site, thousands of specimens were present, and their morphological variation suggests that they also spread generatively (Sekerka in Lustyk & Doležal 2020).

Galega orientalis (→ neo cas) is native to the Caucasus, and especially in Russia, it is cultivated as a forage crop. Several groups of plants were found in 2020 in a meadow near the town of Bochov in western Bohemia (Čepelová in Lustyk & Doležal 2021).

Gaura lindheimeri (→ neo cas) is native to the southern USA. A single plant was observed as escaped from cultivation in 2016 in the village of Velenka in central Bohemia (Koritta in Lustyk & Doležal 2019). Later on, several dozens of mostly non-flowering plants (rosettes) were found in 2019 in a lawn in the village of Průhonice near Prague, and a single plant was recorded in 2021 near the town of Břeclav in southern Moravia (Prančl in Lustyk & Doležal 2022).

Gentiana purpurea (→ neo cas) is distributed in the Alps and in south-western Norway. Since 2005, it has been known to occur as deliberately planted at Mt Vysoká hole in the Hrubý Jeseník Mts (Bureš 2019).

Geranium aequale (→ neo cas), native to western Europe, was found in 2009 in a city lawn in Prague's city district of Hloubětín and in 2013 at the railway station Ostrava-Mariánské Hory in northern Moravia. Both occurrences were temporary (Hlisnikovský in Hadinec & Lustyk 2015, Hadinec et al. 2021). Another population was found in a ruderal lawn in the village of Mečeříž in central Bohemia (Z. Kaplan 2017 herb. Kaplan).

Geranium thunbergii (→ neo cas) is native to China, Korea and Japan. A small population of this species was observed in 2013 on alluvial deposits of the Dyje river near the town of Břeclav in southern Moravia. The way of introduction is unknown (Uher in Hadinec & Lustyk 2015).

Gypsophila perfoliata (→ neo cas) was collected in 1965 by Z. Kilián in ore yards in Ostrava's city district of Vítkovice and near the town of Polanka nad Odrou in northern Moravia. Still, these records were published more than 50 years later by Danihelka & Šumberová (in Kaplan et al. 2018a). Since then, this species has been recorded in the town of Třinec in Silesia, where it is locally established, and on spoil tips near the town of Chodov in western Bohemia (Hlisnikovský & Trávníček in Lustyk & Doležal 2021).

Heracleum sosnowskyi (→ neo cas) is a tall monocarpic perennial native to the western North Caucasus and south-western and eastern Transcaucasia (Jahodová et al. 2007). It was described as late as 1944, and sometimes it is considered conspecific with *H. pubescens*, which is native to Crimea (Hand 2011). From the late 1940s, *H. sosnowskyi* was cultivated as a forage crop and sometimes also as an ornamental. It has become naturalized or even invasive in several European countries, including Poland, the Baltic countries and some parts of European Russia (Jahodová et al. 2007). In 2018, a stand of a large hogweed species was found on alluvial deposits in the bed of the Olše river near the village of Návsí in eastern Silesia. These plants were later identified by M. Marek as *H. sosnowskyi*, which is the first record of this species in the Czech flora (Doležal et al. in Lustyk & Doležal 2020).

Hibiscus syriacus (→ neo cas) is native to China. Its frequent cultivation in private gardens dates back to the late 1990s or early 2000s. In recent years it is very frequently escaping from cultivation in private gardens, and the first spontaneous occurrences have been recorded in abandoned gardens and by garden fences in Prague and the town of Valašské Meziříčí in eastern Moravia (Sádlo in Pladias).

Houttuynia cordata (→ neo cas) is native to south-eastern Asia. Records of escaping and established or invasive plants exist from various parts of the world, mainly with subtropical climates. In Europe, this species has been cultivated as an ornamental since the early 19th century and recently also as a vegetable and medicinal plant by members of the Vietnamese community. Since 2002, escaped plants have been recorded in several European countries, including Great Britain, Belgium, Austria and Hungary. In 2015 and 2017, this species was found at two sites on the bank and alluvial deposits of the Dyje river between the town of Břeclav and its part Poštorná in southern Moravia (Uher in Lustyk & Doležal 2018).

Impatiens edgeworthii (→ neo cas) is an annual species native to the Western Himalayas and sometimes cultivated as an ornamental. It is now spreading in Germany. In 2020, this species was found at two sites in the alluvial forest Kančí obora between the towns of Lednice and Břeclav. The two small populations comprised about 80 individuals altogether (Uher in Lustyk & Doležal 2021).

Inula racemosa (→ neo nat), native to central Asia, was first collected as escaped in the village of Rosice west of the city of Brno (A. Foralová 1979 BRNU), but it was misidentified as *I. helenium*. Some years later, it was found in a sugar refinery in the village of Libáň in eastern Bohemia (Dohnal 1984 HR). After 40 years since the earliest record, this species is locally established in northern Moravia and Silesia (Hlisnikovský in Pladias).

Ipomoea lacunosa (→ neo cas), native to south-eastern North America, was collected in the river port of Nové Loubí in the village of Loubí north of the town of Děčín in northern Bohemia (Jehlík 2013).

Juncus ensifolius (→ neo cas) is an amphi-Beringian species native to the western part of North America, Kuril Islands and northern Japan, sometimes cultivated as an ornamental in garden ponds. It has escaped from cultivation and become established in various parts of the world, including several European countries. The earliest record of *J. ensifolius* in the Czech Republic dates back to 2001, when it was found in the town of Vimperk in a garden pond close to the town centre; it was probably accidentally introduced to that site with ornamental aquatic plants. In 2005, it was recorded in a fishpond in Prague's city district of Nebušice. The latest record is from the drained bottom of the Labská přehrada water reservoir near the village of Bedřichov in the Krkonoše Mts in north-eastern Bohemia. Further records are likely to follow (Kirschner in Kaplan et al. 2019a, Kirschner & Prausová in Lustyk & Doležal 2020).

Kitaibela vitifolia (→ neo cas), native to the western part of the Balkan Peninsula, used to be grown occasionally as an ornamental, but nowadays, it is only rarely cultivated. A small stand of adult plants was found in

Prague's city district of Krč in 2020. The plants grew in tall nitrophilous vegetation on a high mound of soil piled up on land abandoned after the closure of a horticultural school (Sádlo in Lustyk & Doležal 2022).

Knautia macedonica (→ neo cas) is native to the Balkan Peninsula and has been cultivated as an ornamental in recent decades. A few escaped specimens were observed in the village of Nedabyle in southern Bohemia (M. Lepší in Lepší & Lepší 2019).

Kniphofia ×praecox (→ neo cas) is an artificial hybrid derived from species native to southern Africa. It is easily available on the market and rather frequently cultivated. It is reported as naturalized from the British Isles. In 2020, a single specimen with six inflorescences was observed as escaped, probably grown from garden waste, near the village of Leskovec in northern Moravia (Szokala in Lustyk & Doležal 2021).

Lathyrus laxiflorus (→ neo cas) was collected in 1962 in the city district Ostrava-Vítkovice in northern Moravia from heaps of iron ore reportedly imported from Ukraine. The plants were identified correctly, and the record was published immediately (Kilián & Krkavec 1963). However, the record was neglected until recently (Danihelka & Hlisnikovský 2021b).

Lathyrus sphaericus (→ neo cas). A small population of this species has been observed on Malý Kosíř hill near the village of Slatinice in central Moravia since 2008 (Duchoslav & Krahulec in Hadinec & Lustyk 2014). The find was reported as *L. cicera,* but the photographs by J. Kameníček (available at https://www.biolib.cz) from the same site depict *L. sphaericus*, another red-flowering Mediterranean to sub-Mediterranean species. The population size shrunk from hundreds of flowering specimens in 2013 to a single one in May 2020 (J. Kameníček in litt.).

Lavatera punctata (→ neo cas) is an annual Mediterranean species, only occasionally found outside of this area. In 2016, a single specimen was observed in an abandoned orchard near the village of Pohoří in central Bohemia (Vaníček in Lustyk & Doležal 2020).

Leptochloa decipiens* subsp. *peacockii (→ neo cas; syn. *Dinebra decipiens* subsp. *peacockii*) is native to eastern Australia. It was collected in 1959 and 1960 in the city of Brno, in gardens fertilized with waste from wool sorting and cleaning (Kaplan in Hadinec & Lustyk 2014). The specimens were previously misidentified as *L. chinensis* by J. Dvořák.

Leptochloa fusca* subsp. *fusca (→ neo cas; syn. *Diplachne fusca* subsp. *fusca*) is native to tropical and subtropical regions of the Old World. It was found in 1963 in a garden in the town of Raspenava in northern Bohemia, introduced with waste from wool processing (Kaplan in Hadinec & Lustyk 2014). Although "*Diplachne fusca*" was previously reported from the Czech Republic by Grüll (1979), based on a find from Brno, plants introduced to this city belong to other species.

Liatris spicata (→ neo cas) is a perennial native to the eastern part of North America and widely cultivated as an ornamental in private gardens and public spaces. Records of escaped plants exist from several European countries, including Great Britain, Belgium, Germany and Sweden; in the last decades, it has been planted with increasing frequency also in the Czech Republic. In 2018 and 2019, escaped plants were observed in this country at three different sites, two of them next to cultivated specimens, the third one on gravel deposits of the Labe river without obvious connection to cultivation (Boublík et al. in Lustyk & Doležal 2020).

Ligularia przewalskii (→ neo cas) is a tall perennial plant endemic to central and northern China, in Europe cultivated in botanic gardens, arboretums and public parks, and now also in private gardens and elsewhere as an ornamental. Records of escaped plants are available from Great Britain and Austria. In 2020, one flowering and three sterile plants were observed in a mixed forest north of the town of Desná in the Jizerské hory Mts in northern Bohemia. The origin of this occurrence is unknown (Řepka in Lustyk & Doležal 2021).

Limonium gmelinii (→ neo cas). A sterile specimen of this species, which is native from south-eastern Europe to Siberia and Iran, was collected in 2009 from the road verge of the motorway D1 near the village of Ostrovačice in 2009 but was not identified at the species level. In 2013–2015, three small populations were observed in the central reservation of the motorway D2 south of the city of Brno (Kocián et al. 2016), but they were later destroyed during the renovation of this motorway section. In 2019, a single flowering specimen of *L. gmelinii* was found in the central reservation of a road in the southern part of Brno (Danihelka in Pladias).

Linaria odora (→ neo cas) was collected by Z. Kilián in 1963 and 1964 from iron ore heaps near the town of Polanka nad Odrou to which place it was introduced with iron ore reportedly from southern Ukraine. Herbarium specimens are deposited in five different Czech herbaria. They were misidentified as *L. angustissima*, but this record has never been published. A recent examination has shown that they belong to *L. odora*, a psammophytic species native mainly to southern Ukraine and the south-eastern part of European Russia (Danihelka & Hlisnikovský 2021a).

Linaria pelisseriana (→ neo cas). Four flowering specimens of this Mediterranean species were found in 2014 at the railway goods station in Kopřivnice in northern Moravia (Kocián 2014).

Linaria purpurea (→ neo cas), native to Italy, is sometimes cultivated as an ornamental. It was first recorded as escaped in 1878 in the former military training area between the town of Josefov and the village of Starý Ples in eastern Bohemia (B. Fleischer 1878 PR, Čelakovský 1883). For the second time, it escaped in the nearby town of Jaroměř (R. Traxler 1894 MP). For the third time, *L. purpurea* was collected from a waste place in the city of Brno in 1934, but the plants were misidentified as *L. repens*. In addition, there are a few recent records of *L. purpurea* from various parts of the country (Janáková et al. in Lustyk & Doležal 2021).

Lysimachia ciliata (→ neo cas), native to North America, was recorded in 2012 in an alluvial pool in a floodplain forest in the town of Břeclav in southern Moravia, apparently escaped from cultivation in gardens (Uher 2014).

Mimulus ringens (→ neo cas), native to central and eastern North America, is sometimes cultivated as an ornamental. It was observed in 2016 as escaped in the littoral zone of a lake in an abandoned gravel pit south of the village of Milotice nad Bečvou in north-eastern Moravia (Hlisnikovský in Hadinec & Lustyk 2017).

Mirabilis longiflora (→ neo cas), native to Mexico and the adjacent states of the USA, was observed escaping from cultivation in Prague in 1913 (Domin 1917). However, a search for a herbarium specimen in the herbarium PRC yielded no result (M. Štefánek in litt.).

Miscanthus ×giganteus (→ neo cas) is a sterile triploid hybrid between the diploid *M. sinensis* and the tetraploid *M. sacchariflorus*, usually propagated from rhizome cuttings. It is sometimes cultivated as an ornamental and offered in garden centres, and also as an energy crop. It was first observed in a disused sand pit near the village of Dachovy in eastern Bohemia in 2002; it was introduced there with garden waste. The whole polycormon was removed from the site (Tkáčiková et al. in Lustyk & Doležal 2021). There have been five records since then: some of them represent remnants of failed cultivation as an energy crop (Tkáčiková 2019), and others may represent plants established from garden waste or deliberately planted outside settlements.

Mollugo verticillata (→ neo cas) is an annual species native to the tropical parts of South and Central America. It has been introduced to many parts of the world, including several countries of Europe, where it was first recorded in 1887 in Belgium and has become naturalized in the Mediterranean area. In 2020, several dozens of plants were observed in the city of Hradec Králové in eastern Bohemia (Doležal in Lustyk & Doležal 2021).

Muhlenbergia mexicana (→ neo cas) is a rhizomatous grass native to the USA and southern Canada (Peterson 2003). It has been introduced to western and central Europe, including Belgium, Germany and Austria, where it occurred as a weed in garden centres and subsequently in ornamental plant cultures. At least in some cases, the species was inadvertently introduced with potted plants from the Netherlands (Verloove 2011b). In the Czech Republic, spontaneous occurrences of this species were recorded in garden shops in Prague and Brno and in an unmaintained flower bed among ornamental plants in the city of Pardubice in eastern Bohemia (Řepka et al. in Lustyk & Doležal 2022).

Myriophyllum aquaticum (→ neo cas) is native to subtropical and warm-temperate areas of South America. In Europe, it is grown in aquaria and has been recorded as escaped or deliberately planted in the wild in more than 15 countries of mainly western Europe (Hussner 2012, Tsiamis et al. 2017, CABI 2022a). A large stand of this species was found in a lake in an abandoned quarry at the village of Velim in central Bohemia in 2018 (Koutecký & Müllerová in Lustyk & Doležal 2020).

Myriophyllum heterophyllum (→ neo cas) is native to eastern North America (Aiken 1981). So far, the earliest occurrence in Europe was recorded in 1941 in the United Kingdom (Walsh 1944), and since then, the species was found as introduced, either escaped or deliberately planted in the wild, in ~12 countries of mainly western Europe (CABI 2022b). An unidentified specimen collected in 1925 in the city of Plzeň in western Bohemia was only recently found in herbaria and for the first time determined; unfortunately, the circumstances of that occurrence are unknown (Prančl in Hadinec & Lustyk 2015).

Nassella tenuissima (→ neo cas) is a perennial grass native to South America. In Europe, it is often cultivated as an ornamental, and records of escaped plants are available from several European countries. In the Czech Republic, it has been cultivated since the 1990s. *Nassella tenuissima* is nowadays frequently planted in public spaces in cities and towns. In 2019 and 2020, escaped plants were recorded at nine sites in Prague, the city of Brno and also elsewhere in the country. They were found near the places where it is cultivated, often in pavement joints and at places covered by gravel (Řepka et al. in Lustyk & Doležal 2021). Further records are likely.

***Nymphaea* cv. div.** (→ neo cas). There are two native species in the Czech Republic, *N. alba* and *N. candida* (Tomšovic in KČR 1: 355–360, Kabátová et al. 2014, Kabátová in Kaplan et al. 2019a). However, both are rather rare now, while many of the populations recorded in the countryside belong to alien species and ornamental cultivars, which have been deliberately planted mainly to ponds and river pools. Their reliable morphological identification is often impossible.

Panicum philadelphicum* subsp. *gattingeri (→ neo cas) is native to North America and a naturalized neophyte in some European countries. It was collected in 1995 on the railway in the port of Nové Loubí on the Labe river in the village of Loubí north of the town of Děčín in northern Bohemia (Jehlík & Scholz in Greuter & Raab-Straube 2009). There has been no record in the Czech Republic since then.

Panicum schinzii (→ neo cas), native to southern Africa, was found in 2019 on a road verge north of the village of Vítějovice near the town of Prachatice in southern Bohemia. The population consisted of several dozen individuals scattered along a section of about 10 metres (Lepší & Lepší 2020). Further spread is likely.

Panicum virgatum (→ neo cas), native to North America, is now frequently grown as an ornamental and energy crop. In 2014, it was observed as escaped at two sites in the city of Brno (Chytrý & Danihelka in Hadinec & Lustyk 2015) and, more recently, also in Prague (Sádlo in Pladias) and the town of Kadaň in northern Bohemia (Velebil & Lepší in Pladias). However, there is also one earlier record from the village of Průhonice in central Bohemia (Z. Kaplan 2012 herb. Kaplan), but the plant was originally misidentified as *P. dichotomiflorum*. The plants recorded in Brno were octoploid.

Parthenocissus tricuspidata (→ neo cas). This ornamental woody liana, native to eastern Asia, is grown for wall cover in temperate regions around the world and spreads mainly by bird-dispersed seeds. Spontaneous occurrences were found in 2021 at several sites in Prague at the foot of walls (Sádlo in Pladias). Its emergence in western and southern Europe (e.g. Galasso et al. 2019) is more abundant than in cold regions, so it is possible that its escape was facilitated by the current period of warm winters.

***Perovskia* 'Blue Spire'** (→ neo cas) has become a popular ornamental plant in gardens during the past decades (Grant 2007). Two robust plants were found in a dry ruderal grassland on a slope above a railway track in Prague in 2019, apparently introduced with soil transported during the construction of a golf course nearby (Kaplan in Lustyk & Doležal 2021).

Persicaria capitata (→ neo cas), native to the Himalayas, is sometimes cultivated as an ornamental and rarely escaping. In 2014, it was observed in the town of Lovosice in northern Bohemia and in the town of Lednice in southern Moravia, next year in the town of Týniště nad Orlicí in eastern Bohemia and in the town of Břeclav in southern Moravia (Doležal & Uher in Hadinec & Lustyk 2016, Danihelka & Šumberová in Kaplan et al. 2017a).

Petrorhagia dubia (→ neo cas) is a Mediterranean species distributed from the Iberian Peninsula in the west to the coast of western Asia in the east. It has been introduced into various parts of the world. The only record of this species in the Czech Republic is from 1934, when it was collected from ruderal places in the city of Brno but misidentified as the native *P. prolifera*. It was reidentified as *P. dubia* only recently (Danihelka in Kaplan et al. 2021).

Peucedanum austriacum* subsp. *austriacum (→ neo cas) is native to the mountains of central and southern Europe from eastern France to Romania and Bulgaria. In 2006, a large population of this plant comprising up to ~15,000 individuals was found on Ptačí hrádek hill on the western outskirts of the town of Český Krumlov in southern Bohemia. The closest occurrences of this plant in Lower Austria are located about 130 km from this site. Based on the character of the site and circumstances of this record (Marek et al. 2015), we consider the alien status of this taxon more likely than native.

Phacelia congesta (→ neo cas) is an annual herb native to the south-eastern USA. In Europe, it is cultivated as a forage crop, a nectar source for honey bees and green manure. Escaped plants were recorded in Germany and Hungary. In 2020, several individuals of *P. congesta* were recorded along a forest path on slopes north of

Bosonohy at the south-western outskirts of the city of Brno in southern Moravia (Sutorý in Lustyk & Doležal 2021).

Phleum exaratum (→ neo cas) is native to south-eastern Europe and south-western Asia and has been introduced to western and central Europe. It was collected in 2003 at a railway station in the town of Česká Skalice in eastern Bohemia, probably introduced by traffic (Ducháček & Chrtek 2017, Chrtek & Ducháček in Kaplan et al. 2018a). The population has strongly declined since then.

Phlomis russeliana (→ neo cas)**,** native to Anatolia and Syria, is a naturalized neophyte in the British Isles and a casual neophyte in Belgium. It is an attractive species increasingly cultivated as an ornamental. In 2016, two polycorms were found on a railway embankment near the village of Žabčice in southern Moravia (Uher in Hadinec & Lustyk 2017).

Pinguicula grandiflora* subsp. *grandiflora (→ neo cas) has produced an abundant population in a peat meadow at the village of Rádlo in northern Bohemia, where it was deliberately planted, together with several other nationally or locally alien species, in the second half of the 1980s (Nepraš 2017).

Pinguicula grandiflora* subsp. *grandiflora* × *P. vulgaris* subsp. *vulgaris (→ neo cas) was reported from a mixed population of these taxa found in a peat meadow at the village of Rádlo in northern Bohemia. The plants were observed at this site in 2009–2014 (Štěpán 2014).

Pleioblastus chino (→ neo cas) is a mid-sized species of bamboo native to Japan. It easily survives central-European winters. Therefore, it is sometimes planted as an ornamental. In 2007–2013, four stands of this species were found in the alluvial forests south of the towns of Břeclav and Lanžhot in southern Moravia. Most likely, all four stands were established by deliberate planting decades ago (Řepka in Hadinec & Lustyk 2014).

Polanisia uniglandulosa (→ neo cas), native to Mexico and the southern USA, was collected as a cultivation relict in 1931 on Kunětická hora hill north of the city of Pardubice in eastern Bohemia. The record was published by Laus (1932) as *Cleomella mexicana*. Under this name, it was accepted by Dostál (1948–1950, 1989), but only as a general statement without locality information. For this reason, it was disregarded by Bělohlávková (in KČR 3) and Pyšek et al. (2002, 2012). This is probably the only record of escaped *Polanisia* plants in Europe (Uher & Hadinec in Hadinec & Lustyk 2016).

Polypogon viridis (→ neo cas) is a perennial grass native to the Mediterranean area and some parts of south-western and central Asia. It has been introduced to several countries of Europe outside its Mediterranean part and also to many other parts of the world. In 2020, two individuals of this species were found in a garden centre in the village of Brněnské Ivanovice in the city of Brno. Living plants or seeds of *P. viridis* may have been introduced with potted plants imported from the Netherlands (Řepka in Lustyk & Doležal 2021).

Potentilla pensylvanica is a perennial species up to ~0.6 m tall, native to eastern Asia, North America and also distributed in the Western Alps and Spain (Soják 1987, Errter & Elven 2014). One plant was found at the edge of pavement among cobble stones in the village of Čestlice south-east of Prague in 2021 (F. Krahulec in litt.). The origin of the occurrence is most likely related to hybridization experiments conducted on the premises of the Institute of Botany in Průhonice in the 1960s–1970s (Soják 2012).

Primula japonica (→ neo cas) is documented as escaped from gardens or deliberately planted around forest springs and along forest streams at three sites in this country. The earliest record dates to ~1900, when this species was observed in a forest near the village of Újezd u Boskovic in central Moravia; this population persisted for more than a century (Lustyk in Hadinec & Lustyk 2014).

Proboscidea fragrans (→ neo cas), native to Mexico and Texas, is a tall annual species rarely cultivated as an ornamental, and its bizarre-shaped capsules are sometimes used in dry bouquets. In 2019, three plants were observed on a road verge and in a field margin north of the town of Břeclav-Charvátská Nová Ves in southern Moravia. The way of introduction is unknown (Uher in Lustyk & Doležal 2020).

Prunus tomentosa (→ neo cas) is native to the Korean Peninsula, northern and western China, Tibet and probably also to northern India. In Europe, this species is sometimes cultivated both as an ornamental and for fruits. Saplings of this species were first recorded in 2012 next to cultivated individuals in the village of Průhonice near Prague. In 2018, one shrub, about 1.2 m tall, was found on the bank of an oxbow lake of the Labe river near the village of Třebeš on the southern outskirts of the city of Hradec Králové in eastern Bohemia. No cultivated specimens were seen in the surroundings (Samková & Doležal in Lustyk & Doležal 2019).

Pseudotsuga menziesii* var. *glauca (→ neo cas) is native to the western part of North America, replacing the type variety in the interior of the continent. In the Czech Republic, it is rather frequently cultivated as an ornamental. In 2016, a single, about 0.5 m tall sapling was found in one of Prague's nature reserves close to fruiting mature trees (Lepší & Lepší in Lustyk & Doležal 2018). This is the first record of an escaped plant in this country.

Pteris cretica (→ neo cas), native probably to eastern Asia, southern Europe and Africa, is in central Europe cultivated for ornament mainly as a houseplant. In 2016, a single specimen, probably representing the widely cultivated variant 'Albomarginata', was observed in a castle well in the town of Boskovice in central Moravia (Novák 2018).

Quercus frainetto (→ neo cas) is native to Romania, the Balkan Peninsula, a part of Anatolia and the southern part of the Italian Peninsula. In the Czech Republic, it has been recorded in the wild at five sites. Its distribution pattern and the character of its populations in this country suggest that all the occurrences are most likely secondary, probably due to planting in forests (Novák & Roleček 2013, Jelínek & Úradníček in Kaplan et al. 2022).

Rosa* ×*francofurtana (→ neo cas) is an old cultigen most likely derived from the cross *R. gallica* × *R. majalis*. Nowadays, it is cultivated only rarely. In 2012, one shrub of this hybridogenous species was found in the military training area of Boletice in southern Bohemia. The site is situated at the place where once was the village of Květná (Blumenau), whose German-speaking inhabitants were expelled from this country after 1945. It may be therefore assumed that the shrub concerned was planted during the 1930s or even earlier (Grulich in Lustyk & Doležal 2020).

***Salix matsudana* 'Tortuosa'** (→ neo cas). This striking and fast-growing taxon sometimes escapes from cultivation because it regenerates easily. Broken branches take root when carried by floods, moved with garden waste or transported by heavy machinery during landscaping. Since 2013, the species has been found several times in Prague in places where the possibility of deliberate planting could be excluded (2020 Sádlo in Pladias).

Salvia hispanica (→ neo cas) is a tall annual herb native to Central America. Recently, its seeds, referred to as chia seed, have become a fashionable ingredient of what is considered healthy food. They are usually neither cooked nor minced, and they pass with sewage water to rivers and other water courses where they massively germinate on alluvial deposits after floods. There are also records from ruderal lawns in settlements and railway stations. However, the plants usually do not flower, probably due to short days or cool nights later in the season (Štěpánková in Kaplan et al. 2018b, Sádlo & Marek in Lustyk & Doležal 2018).

Scoparia dulcis (→ neo cas) is native to the tropics of Central and South America. It is used in traditional medicine and has been introduced to many parts of the world with tropical and subtropical climates, where it occurs mainly in ruderal habitats. In 2018, one plant was found in a garden centre in Tuřany at the south-eastern outskirts of the city of Brno. No information is available on how seeds of this tropical plant were introduced to this site (Řepka in Lustyk & Doležal 2019).

Selaginella kraussiana (→ neo cas), native to Macaronesia and western Africa, is cultivated in most of the world, usually as an indoor ornamental, and occasionally escapes. In Europe, this species often grows as a greenhouse weed, whereas in natural conditions, it rarely escapes from cultivation (Verloove 2010b). A population of this species was found in 2019 in the city of Karlovy Vary in western Bohemia and still persists at the site. A stand occupying 5 m^2 grows in a short mossy lawn in front of a spa hotel (Sádlo in Lustyk & Doležal 2022).

Silene csereii (→ neo cas) was collected from iron ore heaps in the town of Třinec in Silesia in 1961 and near the town of Polanka nad Odrou in northern Moravia in 1964, in both cases on iron ore reportedly imported from southern Ukraine. The specimens from Třinec were identified as *S. inflata* var. *leptophylla*, and the record was published under this unclear name (Kilián & Krkavec 1962). The specimens collected near Polanka nad Odrou were misidentified as *S. inflata*. Only recently, herbarium specimens from both sites were assigned to *S. csereii* (Danihelka & Hlisnikovský 2021a).

Silene stricta (→ neo cas) was collected from iron ore heaps in Ostrava-Vítkovice in 1960 and originally identified by V. Skřivánek as *S. muscipula*. This record was published by Kilián & Krkavec (1962) under this name and later accepted also by Dostál (1989) but not, for instance, by Šourková (in KČR 2) and Pyšek et al. (2002). A re-examination of the available specimens has shown that they represent similar and closely related *S. stricta* (Danihelka & Hlisnikovský 2021b).

Solanum alatum (→ ar cas) occurs mainly in southern, south-eastern and central Europe, as introduced probably also elsewhere, but the available information is rather fragmentary. In the Czech Republic, *S. alatum* is most likely an archaeophyte, but these once-naturalized populations may have disappeared by the end of the 1960s. Since then, only a few records of plants exist due to accidental introductions with raw cotton (Štěpánek in KČR 6). The species was omitted from the previous editions of this catalogue only by mistake (cf. Pyšek et al. 2002, Pyšek et al. 2012b).

Spiraea latifolia (→ neo cas; syn. *S. alba* var. *latifolia*), native to eastern North America, is rarely cultivated as an ornamental (Businský in Kaplan et al. 2019a). The first escaped individual was found in 1946 somewhere around the Bystřička water reservoir in eastern Moravia. Until recently, there have been records of *S. latifolia* from four sites in this country (Velebil & Businský in Kaplan et al. 2023). Two of the extant occurrences are obviously remnants of old cultivation near current or abandoned settlements.

Sporobolus vaginiflorus (→ neo cas) is an annual grass of sandy habitats native to eastern North America. It is naturalized in several countries in southern Europe and spreads along roads towards the north. Recently, it was recorded, for instance, in Austria, Hungary and Germany. In the Czech Republic, *S. vaginiflorus* was first recorded in 2020 on a road verge between the town of Břeclav and the village of Hrušky in southern Moravia (Kúr & Paulič in Lustyk & Doležal 2021).

Suaeda salsa (→ neo cas) is a halophyte native to the forest-steppe and northern steppe zones between the Pannonian Basin in the west and south-western Siberia in the east (Freitag & Lomonosova 2006). In the Czech Republic, it was found in 2014 on the motorway D5 in western Bohemia, where it occurs on the road verges with increased soil salinity due to the application of deicing salts (Ducháček et al. in Kaplan et al. 2018a).

Symphytum grandiflorum (→ neo cas) is native to Transcaucasia and north-eastern Anatolia. It was introduced to central Europe, where it is sometimes cultivated in gardens and escaping, e.g., in Germany. In the Czech Republic, this species was first found escaped in 2016 in Prague's city district of Krč (Sádlo sec. Kobrlová & Hroneš 2017).

Symphytum ×hidcotense (→ neo cas) is probably an artificial triple hybrid derived from the combination *S. grandiflorum* × *S.* ×*uplandicum*, which originated in Great Britain and is sometimes cultivated as an ornamental. Several cultivars exist, with the most frequent being probably 'Hidcote Blue'. In 2016, J. Sádlo found about 50 plants in an abandoned park near the town of Ivančice in south-western Moravia. They represent a remnant of former cultivation (Sádlo sec. Kobrlová & Hroneš 2017).

Symphytum tauricum (→ neo cas) is native to the region around the Black Sea. The occurrence of the species was first reported by Smejkal (1978) based on a doubtful mixed herbarium specimen collected in 1912 in the town of Černošice near Prague. In the 1980s, the species was repeatedly recorded from garden waste and a road verge in the vicinity of villages Miřetice and Ptákova Lhota in south-western Bohemia (Kobrlová & Hroneš in Kaplan et al. 2016a).

Tellima grandiflora (→ neo cas) is native to western North America from Alaska to California. Three plants were found in 2012 in the town of Lednice in southern Moravia as escaped from the flower beds of the nearby Faculty of Horticulture of Mendel University (Uher in Hadinec & Lustyk 2015).

Teloxys aristata (→ neo cas) is native to the continental parts of Asia and the adjacent part of eastern Europe. Records of introduced plants in central and western Europe date to 1837, when this species was found in Venice. Since then, it has been found in numerous European countries. It is naturalized in Hungary and Ukraine, while occurrences in other countries with more humid climates are usually temporary. In 2016, a dozen flowering plants were found on an industrial railway in Břeclav-Poštorná in southern Moravia. Seeds of *T. aristata* may have been accidentally imported with phosphate rock from Kazakhstan (Uher in Hadinec & Lustyk 2017).

Teucrium hircanicum (→ neo cas), native to the North Caucasus, Transcaucasia and adjacent parts of Anatolia and Iran, was found in 2011 in a forest fringe along a tourist path close to gardens at the edge of a village of Dolní Zálezly in northern Bohemia (Nepraš et al. 2011, K. Nepraš pers. comm.).

Thermopsis villosa (→ neo cas) is a tall perennial native to the eastern USA. It is sometimes cultivated as an ornamental and easily available in garden shops and via the internet. One flowering specimen was observed in 2018 in a meadow at the northern outskirts of the town of Havlíčkův Brod in eastern Bohemia. It could not be established whether this occurrence is due to garden escape or artificial planting (Čech & Lustyk in Lustyk & Doležal 2020).

Thuja plicata (→ neo cas), native to western North America, is widely grown as an ornamental tree in gardens and parks in central Europe. Several young trees grown from seeds were found in 2006 near the parent tree in the former village of Schwarzviertel in the Novohradské hory Mts in southern Bohemia (Lepší & Lepší 2013).

Tordylium apulum (→ neo cas) is native to the Mediterranean area. In 2015, a single plant was found at a transit shed at a railway station in the town of Borohrádek in eastern Bohemia. Seeds of this species were probably introduced there with bauxite from Montenegro (Doležal in Hadinec & Lustyk 2016).

Toxicodendron radicans (→ neo cas) is native to the eastern part of North America. A single escaped plant was recorded in 2018 at a ruderal site in the village of Oldřišov in Silesia (O. Škrabal 2018 BRNU). In 2019, it was observed in the Lednice chateau park in southern Moravia (Sádlo in Pladias). In 2021, a large specimen, now removed, was found in the village of Chotěbuz in Silesia (Chytrá 2021, Hlisnikovský 2022).

***Tradescantia ×andersoniana* cv. div.** (→ neo cas) is the name for cultivars derived from the hybridization of *T. ohiensis*, *T. virginiana* and *T. subaspera*, which are native to eastern North America. The cultivars are grown for ornament and occasionally escape from cultivation. The name *T. ×andersoniana* is used by Jäger et al. (2016), who state that the parental species are no longer cultivated. Reliable identification of these plants is often impossible. The Pladias database lists only four occurrences, which were probably a result of discarding rhizomes or stems in garden waste.

×Tripleurothemis maleolens (→ ar cas; *Anthemis cotula* × *Tripleurospermum inodorum*) was collected in 1886 near the village of Chudenice in south-western Bohemia (Čelakovský 1888d). Dvořáková (in KČR 7) expressed some doubts about the identity of the plants concerned. However, a recent inspection of the specimens stored in the herbaria PR and MP confirmed Čelakovský's opinion about their hybrid origin (Prančl in Lustyk & Doležal 2022).

Urochloa platyphylla (→ neo cas) is native to south-eastern North America, Cuba, Bolivia and Argentina. It was collected in yards of industrial facilities in the city of Ústí nad Labem in northern Bohemia and the town of Kolín in central Bohemia, and at a railway station in the city of Ústí nad Labem, introduced as soybean admixture (Jehlík 2013).

Veronica gentianoides (→ neo cas) is a perennial species native to the mountains of western Asia and Crimea. It is an attractive species cultivated in central Europe in botanical gardens and as an ornamental in rock gardens since the early 19th century. In 1939–1946, escaped plants were collected near the town of Telč in western Moravia by J. Diener. The plants were probably identified much later because this find was only published by Smejkal (1980), based on the specimen deposited at MJ. In 1993 a small group of escaped plants was observed in the town of Vrchlabí in north-eastern Bohemia (Danihelka & Harčarik 2019). At both sites, the occurrences were only temporary.

Viola sororia (→ neo cas) is native to North America. It is sometimes cultivated as an ornamental, usually in the cultivar 'Freckles'. In 2016, it was found escaped in the town of Bzenec in south-eastern Moravia (D. Uhýrková 2016 BRNU; Danihelka in Kaplan et al. 2019a).

Wisteria sinensis (→ neo cas) is a robust woody liana, native to eastern Asia and grown as an ornamental in temperate regions around the world. Due to its vigorous growth and clonality, it easily overcomes strong disturbances by means of vegetative propagation. A large stand of *W. sinensis* was found in 2018 in Prague in a former garden levelled by heavy machinery during the demolition of a cottage and then abandoned for several years. Seed germination of this species has also been observed in Prague, so far limited to seedlings observed in gardens (Sádlo in Lustyk & Doležal 2020).

Yucca flaccida (→ neo cas) is native to the eastern part of North America. In Europe, this species is cultivated as an ornamental for two centuries, but under various names due to taxonomic and nomenclatural confusion. In central Europe, these plants were usually referred to as *Y. filamentosa*, in the former Czechoslovakia, for instance, by Dostál (1989). In the Flora of the Czech Republic (Bělohlávková in KČR 8), they were assigned to *Y. smalliana*. However, this taxon is now considered conspecific with *Y. flaccida*, which is the correct name for most plants cultivated in this country as ornamentals and recorded here and there as cultivation relicts or growing from garden waste. Recent records from Silesia and north-eastern and southern Moravia were summarized by Uher et al. (in Lustyk & Doležal 2019). One of the plants was recorded on gravel bars in the Rožnovská Bečva river near the town of Rožnov pod Radhoštěm without any connection to cultivation or garden waste.

CHANGES TO TAXA INCLUDED IN THE PREVIOUS EDITION

Change of origin status and residence time (12 taxa)

Anthemis ×ochroleuca (native → ar cas; *A. austriaca* × *A. tinctoria*) was described by Čelakovský (1888c) based on a specimen collected near the village of Povrly west of the city of Ústí nad Labem. The plants corresponding to this parental combination are more or less intermediate but difficult to distinguish particularly from *A. tinctoria* due to their strong variation in ligule colour. Since the original find, this hybrid has been recorded from four additional sites in northern Bohemia (Prančl in litt.). With some doubt about the identity of the plants, it was included in the Checklist of the Czech flora (Danihelka et al. 2012) but was not listed in the previous edition of the Catalogue (Pyšek et al. 2012b).

Datura stramonium* var. *stramonium (neo → ar). We assume that most of the old records refer to this variety, which is nowadays more abundant in Europe than *D. s.* var. *tatula*. It has long been disputed whether this species is native to Asia or to the Americas. According to the CZAD database, macroremains of *D. stramonium* were found in two Late Medieval localities, namely in the town of Opava in Silesia and in the town of Staré Město u Uherského Hradiště in south-eastern Moravia. The south-Asian origin of this species is also documented by Geeta & Gharaibeh (2007).

Elsholtzia ciliata (ar → neo) was considered an archaeophyte in the previous editions of this catalogue (Pyšek et al. 2002, 2012). However, it is native to eastern Asia from Mongolia to Japan (Li & Hedge 1994), and we have not found any species' record in medieval and early modern literature. It was described by Thunberg (in Murray 1784 as *Sideritis ciliata*) on the basis of his east-Asian travels. According to the Pladias database, it is a casual alien species, escaping mainly transiently in the vicinity of its cultivation sites. By analogy with most other east-Asian herbs, we now assume its introduction in the 19th century.

Ornithogalum divergens (native → ar/neo nat; *O. umbellatum* auct.) is a pentaploid or hexaploid member of the *O. umbellatum* agg. It reproduces mainly (if not exclusively) vegetatively: mature plants are usually surrounded by a large number (up to 50) of bulbils. In the Czech Republic, it is usually found near and in settlements, including street lawns and *Robinia* stands (Hroneš et al. Lustyk & Doležal 2019). It is also cultivated as an ornamental in settlements and graveyards. Its distribution and affinity to secondary habitats suggest its alien status, but the exact time of introduction is difficult to assess.

Orobanche minor (ar → neo). The earliest record of *O. minor* in Bohemia is from 1876, that in Moravia from 1904 (Zázvorka in Kaplan et al. 2019b). Most of these early records are associated with the cultivation of various clover species as forage crops. This suggests that the species should be classified as a naturalized neophyte.

Petrorhagia saxifraga (native → neo nat) was until recently considered native to the Czech Republic, based on a herbarium specimen collected near the town of Lanžhot in southern Moravia in 1940 (Šourková in KČR 2). This site is situated close to the Zahorie lowland in western Slovakia, where this species is considered native. Although this part of Moravia was well botanically explored already then, this remained the only record of *P. saxifraga* from this area. Therefore, we believe that the record under consideration represents a garden escape. *Petrorhagia saxifraga* is frequently cultivated as an ornamental, easily escapes, and the earliest record of an established population near the town of Třeboň in southern Bohemia dates back to the 1810s (Danihelka in Kaplan et al. 2021). Therefore, we classify it as a naturalized neophyte.

Rapistrum rugosum* subsp. *rugosum (ar → neo). Although this Mediterranean plant is reported from south-western Germany from the Iron Age (Stika 1999), there is no evidence of its archaeophytic occurrence in the Czech Republic. Even if such occurrences existed, all available records are due to later introductions; therefore, the taxon is reclassified as a neophyte.

Silene dichotoma (ar → neo) is native to south-eastern Europe and western Asia. It was first recorded in Bohemia in 1841 (Čelakovský 1873, Šourková in KČR2) and in Moravia as late as 1871 (Danihelka & Kaplan in Pladias). Most of these early records come from clover and alfalfa fields. Therefore, we assume that seeds of *S. dichotoma* were introduced as a contaminant of commercial seeds of *Fabaceae* imported from southern Europe. These occurrences have nothing in common with archaeobotanical records from Bohemia and Moravia (cf. CZAD). Already Šourková (in KČR2) suggested the neophytic status of *S. dichotoma* in this country's flora, and we follow her opinion. While this species is more or less established in areas with warm climates, occurrences at middle and high elevations are temporary.

Sorbus intermedia (native → neo nat) is a hybridogenous species regarded as native to southern Sweden and parts of the Baltics, occasionally naturalized elsewhere in Europe. In the Czech Republic, it is commonly planted as an ornamental in towns, parks and along roads and occurs as an escape from cultivation in scrub, forest fringes, open forests, dry grasslands, on stone walls and in quarries (Lepší & Lepší in Kaplan et al. 2016a). The opinion that this species is native to this country (Kovanda 1997), based on herbarium specimens collected in the 19th century in the Krkonoše Mts, is rather speculative.

Sorbus quernea (native) → ***S. mougeotii*** (neo nat) is native to western Europe and is cultivated in central Europe. A large viable population in Prague's city district of Libeň was once described as an endemic species under the name *S. quernea* (Kovanda 1996), as shown by Lepší et al. (2013) and Lepší & Lepší (in Kaplan et al. 2016a).

Trifolium diffusum (native → neo cas) is native to the Mediterranean area and northern part of the Balkan Peninsula, towards the north extending as far as eastern Slovakia and southern Ukraine (Kubát in KČR 4). The only record of this species in the Czech Republic is from 1923, when it was collected in steppic grasslands on sands near the village of Mutěnice in southern Moravia (Podpěra 1937). This occurrence was considered "possibly native" (Kubát in KČR 4), but this seems to be very unlikely, one of the reasons being the lack of earlier records. Therefore, we reclassify *T. diffusum* as a casual neophyte.

Vinca minor (native → ar/neo). The native status of this species has been both rejected and defended (Slavík in KČR 6). However, a genetic analysis of Czech and German populations of *V. minor* (Čepková et al. 2016) showed, apart from modern cultivars, a single widely distributed genotype that corresponds to a clonally spread and long-established population of medieval origin. Therefore, we reclassified the status of this species to a naturalized alien. It is also considered alien to Germany (Prange 1996).

Change of invasion status (66 taxa)

Abutilon theophrasti (nat → inv). This thermophilous annual species starts to be widespread (recorded in 216 grid-cell quadrants) and becoming an important weed in the lowlands, dominating large patches, especially in late-maturing crops such as sugar beet and maize (Mikulka & Štrobach 2017, Šumberová et al. in Kaplan et al. 2019b). With agricultural activity and transport, it is already penetrating into higher elevations, spreading into forests with game fodder and to alluvial habitats with flooding. The species requires a long growing season, and its spread is therefore encouraged by the current climate change.

Acer tataricum (cas → nat) is reported in the Pladias database from many localities, but often it is not possible to distinguish escaped plants from planted ones. However, there are several large self-sustaining populations in Prague (0.1–10 ha, with 50–200 fertile plants at each site). The populations have established in the broad vicinity of cultivated individuals and spread to unmaintained parks, ruderalized rocky hillsides, and tall peri-urban grasslands and scrublands.

Agrostemma githago*, *Bromus secalinus*, *Bupleurum rotundifolium*, *Misopates orontium*, *Nigella arvensis (all cas → nat). The invasion status of these segetal archaeophytes was changed based on the evaluation of the recent records in the Pladias database. These species were on the brink of extinction in the late 20th century. Currently, although herbicide application in cereal fields is still increasing, there are also opposite trends in these species' dynamics, driven by organic farming and conservation programs, their survival in ruderal vegetation, or the use of commercial mixtures of annuals that are often planted in the wild. In *Agrostemma githago* and *Bupleurum rotundifolium*, most recent populations are probably genetically distinct from the spontaneous ones. However, since they cannot be reliably distinguished taxonomically, they were included in the species assessment. Since 2012 all these species have been found at 30–50 sites each.

Allium paradoxum* var. *paradoxum (nat → inv). This plant, in central Europe propagating only by bulbils, colonizes mainly parks, ruderal groves and shrubs and also vegetation along streams. This highly competitive species forms an understory dominant in areas up to several hectares in size and outcompetes other herbs, especially spring geophytes. Its largest populations are found in Prague, where they probably originated in the early 20th century, but local populations started to spread into the surroundings ~20 years ago; other populations are probably newly established (Lustyk & Doležal in Lustyk & Doležal 2018). The spread of *A. p.* var. *paradoxum* is encouraged by the current fashion of consuming spring leafy vegetables. Information on its occurrences is shared on the internet, sites are visited, and plants are harvested; the species is also being sold by horticultural companies. The spread is both intentional (plantings followed by spontaneous escape) and unintentional (bulbs of uprooted plants and bulbils in inflorescences are discarded as part of harvest waste). Note that in the previous edition, the taxon was included under the name *A. paradoxum*, but escaping plants represent the type variety characterized by the extensive production of bulbils (Krahulec & Duchoslav in KČR 8).

Amaranthus albus (nat → inv). The Pladias database shows a significant increase in the number of records after 2000. This species spreads mainly along railways; in railway junctions (in the cities of Prague, Ostrava and Brno) it already forms extensive populations. In southern Moravia, it is also spreading on sandy arable land. The spread of this species is supported by climate change and probably also by using herbicides on railways. *Amaranthus albus* has a late vegetation optimum and thus benefits from long warm autumns. It germinates in summer when railway areas are no longer treated with herbicides.

Amaranthus bouchonii*, *Bidens connata*, *Eragrostis albensis*, *Euphorbia maculata*, *Geranium purpureum*, *Lepidium didymum*, *Lycopsis orientalis*, *Microrrhinum litorale*, *Panicum capillare* subsp. *barbipulvinatum*, *Persicaria pensylvanica (all cas → nat). The status of these unintentionally introduced neophytes was reclassified from casual to naturalized based on recent records in the Pladias database and current floristic literature. Many of their occurrences are still casual, but these species now also form stable populations, independent of the sources of their introductions. The emergence of large and long-lasting populations of these thermophilous species in the last decade is probably supported by a series of warm winters. The occurrences of these species are associated with young river bars along the Labe river (*Amarantus bouchonii*, *Persicaria pensylvanica*, *Bidens connata* and *Eragrostis albensis*), with urban habitats (*Eragrostis albensis*, *Euphorbia maculata*, *Microrrhinum litorale*, *Lepidium didymum* and *Panicum capillare* subsp. *barbipulvinatum*) and with railway traffic (*Geranium purpureum* and *Lycopsis orientalis*).

Amaranthus crispus*, *Artemisia annua*, *Campanula rhomboidalis*, *Erysimum cheiri*, *Hesperis matronalis* subsp. *candida*, *Rumex triangulivalvis*, *Sicyos angulatus (all nat → cas). The number of recent records in the Pladias database showed the need to reclassify the invasion status of these species to casual. All these taxa were introduced and became temporarily naturalized in the (19–)20th century, but none of them has been recorded for several decades, except for a single recent record in *Amaranthus crispus*.

Amelanchier lamarckii (cas → nat) has long been widely naturalized in semi-natural habitats in the broad surroundings of the town of Nové Hrady in southern Bohemia (Lepší & Lepší 2008).

Anaphalis margaritacea (cas → nat) has recently spread widely from ornamental gardens to the villages, along streams and into forest edges. Especially at higher elevations, *A. margaritacea* forms sustainable dispersing populations.

Angelica archangelica* subsp. *archangelica (inv → nat). Based on the Pladias database records, we revise the former assessment of the species that followed the Flora of the Czech Republic (Slavík in KČR 5). It was found mainly in the second half of the 20th century, but there are only seven records from the last decade. The invasion of this species, which was never very strong, has probably ceased.

Anthriscus caucalis (cas → nat) is an archaeophyte still classified as an endangered declining species in the last edition of the national Red List (Grulich 2012). However, it has never been very rare, according to the Pladias database. After some decline, it has become common since the 1990s, especially in central Bohemia and southern Moravia. Large populations occur mainly in ruderal habitats and in *Robinia* forests.

Anthriscus cerefolium* var. *cerefolium (cas → nat) is grown as a leafy vegetable and occasionally escapes from cultivation. Long-lasting occurrences also exist, e.g., on Petřín hill in Prague, where it survives (co-occurring with *A. c.* var. *trichocarpus*) since the beginning of the 20th century.

Artemisia annua (nat → cas). See *Amaranthus crispus* for an explanation of the change in the invasion status.

Atriplex micrantha (cas → inv). This neophyte, which occurred mainly along motorways, is characterized by a recent rapid spread. Its occurrence is no longer strictly confined to the motorways. It was introduced earlier but has been spreading massively since the early 2010s. Spread by road traffic, it begins to invade ruderal habitats in urban areas and along minor roads.

Avena strigosa (nat → cas). This allegedly naturalized archaeophyte has been missing since 1946; apparently, it may have never been naturalized in this country.

Bidens connata (cas → nat). See *Amaranthus bouchonii* for the justification of change in invasion status.

Bifora radians (nat → cas). The invasion status of this segetal archaeophyte was changed based on the evaluation of the records in the Pladias database. Since 2012, *B. radians* was observed at only four sites (in contrast to more than 50 records in 2001–2012) and is thus reclassified here as a casual alien.

Brassica nigra (nat → cas). This archaeophyte was recorded in the Early Medieval (CZAD database) and reported as naturalized between 1934 and 2004. Since then, the only find is from a parking lot at the Janáček theatre in the city of Brno, southern Moravia, in 2022.

Bromus secalinus (cas → nat). See *Agrostemma githago* for justification of the change in invasion status.

Bromus sterilis*, *Digitaria sanguinalis*, *Lactuca serriola*, *Setaria pumila*, *Setaria verticillata*, *Setaria viridis* subsp. *viridis*, *Vulpia myuros (all nat → inv). These archaeophytes have always been abundant in ruderal habitats in the lowlands. Their renewed invasion status is a consequence of contemporary suburbanization, agricultural intensification and degradation of segetal and semi-natural habitats, which is compensated by the increase of eutrophic ruderal habitats. In the last decade, these thermophilous species have been colonizing sites above 600 m a.s.l., infiltrating forests, meadows and dry grasslands at lower elevations and massively occurring on arable land and in urban areas. Their spread is favoured by climate change, large-scale disturbance of ruderal habitats, soil technology with reduced tillage, the large proportion of broad-row and winter crops, the link with rail and road transport and, to some extent, resistance to herbicides (Soukup et al. 2018, Chrtek & Danihelka in Kaplan et al. 2022).

Bupleurum rotundifolium (cas → nat). See *Agrostemma githago* for justification of the change in invasion status.

Campanula rhomboidalis (nat → cas). See *Amaranthus crispus* for an explanation of the change in the invasion status.

Cardamine hirsuta (nat → inv). Records of this archaeophyte have been increasing since the 1970s, and since the 2010s, a strong invasion started, with dozens of new records reported every year. This species is a weak competitor but occurs in a wide range of habitats and forms monodominant stands on bare ground.

Conium maculatum (inv → nat). This archaeophyte was abundant in traditional agricultural landscapes as a ruderal species confined to rural habitats. In the second half of the 20th century, it strongly receded when herbicides started to be routinely used in conventional agriculture. This trend reversed in the 1990s when *C. maculatum* began to spread in lowlands, forming large stands around silage pits and pigsties. Later, it started to invade field margins, road ditches and villages, and even penetrated into towns. In the last decade, its spread has been greatly reduced, and the invasion appears to have ceased, as confirmed by a small number of records in the Pladias database. The causes of the current retreat are common herbicide application, ditch mowing and an overall decline of tall nitrophilous vegetation in villages.

Cotoneaster divaricatus (cas → nat) is native to China and commonly cultivated in the Czech Republic. Its spontaneous occurrences were mostly reported in recent years (Pyšek et al. 2012b), when it has also started to escape more often. Of the total number of 75 records in the Pladias database, 56 are since 2012. In central Europe, *C. divaricatus* is the most commonly escaping species of the genus (Dickoré & Kasperek 2010). It spreads by seed and is now forming stable populations around settlements, independent of propagule supply (e.g. Chytrý in Lustyk & Doležal 2018). It is particularly common in the understory of dry light forests.

Datura stramonium* var. *tatula (cas → nat) escapes from ornamental cultivation or spreads with various commodities, but the occurrences have long been sporadic and ephemeral (Štěpánek in KČR 6). It is still rare (12 records since 2012), but repeated records from alluvial river sediments and field crops indicate the emergence of self-sustaining populations that no longer depend on propagule supply.

Digitaria sanguinalis (nat → inv). See *Bromus sterilis* for justification of change in invasion status. Note that in the previous edition of the catalogue (Pyšek et al. 2012b), two varieties were included, i.e. ***Digitaria sanguinalis* var. *pectiniformis*** and ***D. sanguinalis* var. *sanguinalis*.** Both varieties differ in their cultural history (the latter was once rarely sown as a cereal crop), but their taxonomic value is low because the morphological differences are slight and probably controlled by a small number of genes. Moreover, occurrences of *D. s.* var. *pectiniformis* are probably overlooked (Danihelka & Ducháček in Kaplan et al. 2017b), so it is not clear how it contributes to the invasion status of the species. We therefore refrain from classifying the two varieties separately.

Dittrichia graveolens (nat → inv) is a neophyte tolerant to dry and salty habitats and invasive in several central-European countries such as Germany (Kocián 2015). Its first record in the Czech Republic is from 2008 (Raabe in Hadinec & Lustyk 2009), and now it is abundant along motorways. In the last decade, it has already spread in ruderal habitats in urban areas, along roads and in semi-natural vegetation outside villages and up to 800 m a.s.l.

Doronicum pardalianches (cas → nat) is rarely cultivated but successfully escapes, and its populations persist for many decades, forming continuous clonal stands and spreading spontaneously. Large old populations exist in the chateau parks in Nové Hrady and Orlík in southern Bohemia. In 2019, a stand covering hundreds of square metres was found in a forest near the cottage settlement of Jívak near the village of Vlkava in central Bohemia (Sádlo in Pladias).

Elodea nuttallii (cas → inv). This North American hydrophyte is currently invasive throughout Europe (Steen et al. 2019). It was first recorded in the Czech Republic in 1988. Before 2012, *E. nuttalii* was recorded from four sites, while in the decade 2012–2021, this species has 64 records in the Pladias database. These occurrences are situated in the catchment areas of three different seas (basins of the Labe, Danube and Odra rivers). Since 2013, a metapopulation has emerged in the upper reaches of the Ohře river, which is currently spread over ~100 km of the river course and documented by ~40 populations recorded in the Pladias database.

Eragrostis albensis (cas → nat). See *Amaranthus bouchonii* for the justification of change in invasion status.

Erechtites hieraciifolius (nat → inv) is a North American species currently exhibiting a typical invasive behaviour. In the Czech Republic, it was first collected in 1895. Almost one-third of all records in the Pladias database are from the last five years. *Erechtites hieraciifolius* forms large metapopulations, consisting of monodominant stands and spreading all over the country from the warm lowlands up to the mountains. The main habitat of this species is the early successional stages in forest clearings. Its spread is strongly supported by an increasing extent of this habitat due to the current bark beetle outbreak. However, due to the high production of seed and their easy dispersal, single specimens are found in a wide range of habitats outside woodlands, e.g. in cities, on the bottoms of drained fishponds and on edges of motorways.

Erysimum cheiri (nat → cas). See *Amaranthus crispus* for an explanation of the change in the invasion status.

Euphorbia maculata (cas → nat). See *Amaranthus bouchonii* for the justification of change in invasion status.

Geranium purpureum (cas → nat). See *Amaranthus bouchonii* for the justification of change in invasion status.

Hesperis matronalis* subsp. *candida (nat → cas). See *Amaranthus crispus* for explanation of change in the invasion status.

Juglans nigra (cas → nat). This North American tree is now officially claimed as one of the target tree species in lowland floodplain forests in the Czech Republic (Podrázský & Šálek 2018). It is planted in clearings there, and mature trees set seed and germinate easily, so spontaneous dispersal is evident. The nuts are spread by animals and possibly by floods. Escaped individuals of *J. nigra* have also been found in castle parks where this tree is cultivated (Vojík et al. 2020). It is currently escaping with increasing frequency. The oldest trees, which have arisen from spontaneous regeneration, are already prolific and grow mainly on forest edges, in clearings and along roadsides.

Juglans regia (nat → inv). This archaeophyte tree has long escaped from cultivation only rarely and ephemerally, mainly in gardens. After 1995, young trees started to occur in ruderal vegetation outside villages and far from cultivated individuals, and the species was considered naturalized (Pyšek et al. 2002, 2012). The invasion is now underway; spontaneous metapopulations are found in large parts of the Czech and Moravian lowlands, where they are usually part of unmaintained peri-urban grasslands, shrublands and ruderal bosques. Rarely, *J. regia* also forms closed stands (e.g., in Prague) and penetrates into *Robinia pseudoacacia* stands, where it is more successful in competition of the two species (e.g., in the surroundings of the town of Znojmo in southern Moravia). *Juglans regia* also occurs at middle elevations, with records above 650 m a.s.l. dating mainly from the last decade. The likely causes of such invasive behaviour are global warming (Verloove 2010a), the synurbanization of fruit-carrying corvid birds, and changes in vegetation structure around settlements (Lenda et al. 2018).

Lactuca serriola (nat → inv). See *Bromus sterilis* for justification of change in invasion status.

Lathyrus cicera (nat → cas) has been misidentified in the past, and there has been only one documented record of this species since 2014.

Lepidium didymum (cas → nat). See *Amaranthus bouchonii* for the justification of the change in invasion status.

Lycopsis orientalis (cas → nat). See *Amaranthus bouchonii* for the justification of change in invasion status.

Microrrhinum litorale (cas → nat). See *Amaranthus bouchonii* for the justification of change in invasion status.

Misopates orontium (cas → nat). See *Agrostemma githago* for justification of the change in invasion status.

Muscari armeniacum (cas → nat) is a spring bulb geophyte that escaped from cultivation a long time ago (~70 years), forming long-term stable populations. It is most common in settlements but also occurs in natural habitats in the open countryside. The escapes result from former direct plantings, deposition of garden waste and probably many other both human-made and natural means of dispersal. *Muscari armeniacum* inhabits dry sites, most often in light scrub and ruderalized woodland (Uher in Hadinec & Lustyk 2016).

Nigella arvensis (cas → nat). See *Agrostemma githago* for justification of the change in invasion status.

Othocallis siberica (cas → nat) is a spring bulb geophyte that escaped from cultivation a long time ago (~70 years), forming long-term stable populations. It is most common in settlements but also occurs in natural habitats in the open countryside. Escapes are the result of former direct plantings, deposition of garden waste and probably many other both human-made and natural means of dispersal. *Othocallis siberica* is mesophilous and occurs in lawns and nutrient-rich woodlands (Trávníček 2010).

Panicum capillare* subsp. *barbipulvinatum (cas → nat). See *Amaranthus bouchonii* for the justification of the change in invasion status.

Panicum miliaceum* subsp. *ruderale (nat → cas). Records in the Pladias database indicate that this taxon is very rare in the Czech Republic; there are only four records from Moravia.

Persicaria pensylvanica (cas → nat). See *Amaranthus bouchonii* for the justification of change in invasion status.

***Phalaris arundinacea* 'Picta'** (cas → nat) is a variegated cultivar (more precisely, several similar cultivars; Jäger et al. 2016) of the native species *P. arundinacea*, which is common in wet habitats and often referred to as expansive (Brodersen et al. 2008). The cultivar is one of the most commonly cultivated ornamental plants in the Czech Republic (Pergl et al. 2016a) and often escapes. In the Lužické hory Mts, Krkonoše Mts and Orlické hory Mts, many old populations with no clear link to cultivation occur along roads and streams, and plants with colour transitions to the wild type are common.

Plantago coronopus* subsp. *coronopus (cas → nat) has been recorded as a rare casual alien since the 1930s, particularly in Moravia. About a decade ago, its rapid spread started, especially along motorways and other roads throughout the country, including elevations above 800 m.

Rumex triangulivalvis (nat → cas). See *Amaranthus crispus* for explanation of change in the invasion status.

***Sasa palmata* 'Nebulosa'** (nat → cas) was previously considered naturalized on the basis of a single large stand. The stand has persisted in its locality since ~2000, but no new occurrences have been found. Here we assess such isolated occurrences as occasional escapes, which resulted in the reclassification of the invasion status to casual.

Senecio inaequidens (nat → inv). Due to the rapid spread, the invasion status of *S. inaequidens* was already under consideration when the second edition of this catalogue was compiled (Pyšek et al. 2012b). The Pladias database has reported 625 records since 2012, three times more than in 2002–2011. This species is a railroad and motorway weed but also invades a wide range of ruderal habitats both within and outside villages, locally forming monodominant stands. It also invades natural vegetation, such as rocky slopes.

Setaria pumila (nat → inv). See *Bromus sterilis* for justification of change in invasion status.

Setaria verticillata (nat → inv). See *Bromus sterilis* for justification of change in invasion status.

Setaria viridis* subsp. *viridis (nat → inv). See *Bromus sterilis* for justification of change in invasion status.

Sicyos angulatus (nat → cas). See *Amaranthus crispus* for an explanation of the change in the invasion status.

Sisymbrium volgense (nat → cas) was introduced from Russia with grain in the second half of the 20th century, but its occurrences disappeared after the end of grain imports from that region. It has been found only occasionally during the last 20 years, which justifies the assessment of its status as casual.

Solanum lycopersicum (cas → nat). Especially since 2010, the number of records, the size and cover of populations and their occurrence at rather high elevations have increased. This species is common in dry ruderal habitats such as urban pavement edges and has become fully naturalized on loamy deposits in river beds due to warm winters and newly introduced small-fruited tomato cultivars, which ripen quickly. According to Schmitz (2004), tomato seeds easily survive the winter season. The influx of new seeds from village sewage reinforces these populations but is no longer indispensable for the local persistence of the species.

Sorbus domestica (cas → nat). The status in Pyšek et al. (2012b) was based on the assessment by Kovanda (in KČR 4), who considered this species as only cultivated and occasionally escaped. The recent CZAD database provides evidence of its presence since the Early Medieval, and the Pladias database reports hundreds of records, mainly from south-eastern Moravia, where several dozen spontaneous occurrences are reported (Spíšek in litt., Lepší et al. in Kaplan et al. 2016a). As in other naturalized fruit trees, some young individuals are supported by human care, but its ability to spread and form long-term populations predominates, leading to the reclassification of its status to naturalized.

Stachys byzantina (cas → nat). This species escapes from ornamental cultivation with increasing frequency, forming populations from seed. The largest population was found in Prague, consisting of ~70 plants scattered over 3000 m^2 (Sádlo in Pladias). Escaped plants also occur outside villages, far from cultivated specimens, usually growing in short grassland in sunny places.

Toxicodendron pubescens (nat → cas) is rarely cultivated and only exceptionally spreads vegetatively from plantations. Such new escapes are assessed as casual occurrences.

Tragus racemosus (cas → nat) is a thermophilous annual which has occurred in southern Moravia since the early decades of botanical research. It was introduced with sheep wool (Zázvorka in Lustyk & Doležal 2018) and probably became temporarily naturalized in various ruderal habitats. However, there are no records from 1943–2016. In recent years, its new rapid spread along roads and especially along motorways has begun in Moravia and Silesia.

Vulpia myuros (nat → inv). See *Bromus sterilis* for justification of change in invasion status.

Xanthium strumarium (cas → nat). After a taxonomic and floristic revision (Danihelka & Dřevojan in Kaplan et al. 2021), this archaeophyte turned out to be scattered across southern Moravia. Records from the last few years are rather numerous, some of them resulting from the introduction with crop seed.

Change of name based on reidentification and/or reassessment of the rank (32 taxa)

Amaranthus ×alleizettei (*A. caudatus* × *A. powelii*) → ***A. caudatus* × *A. retroflexus***. There are five herbarium specimens of this hybrid collected in the Czech Republic, mainly from waste disposal places. Three of the five specimens cited by Letz (in Lustyk & Doležal 2019) were once, most likely erroneously, assigned to the combination *Amaranthus caudatus* × *A. powellii* (*A.* ×*alleizettei*; cf. Jehlík in KČR 2). All those five records were reidentified as hybrids derived from the combination *A. caudatus* × *A. retroflexus* (Letz in Lustyk & Doležal 2019).

Amaranthus powelii* × *A. retroflexus* → *A.* ×*sopronienisis This hybrid is relatively frequent in places where its parents co-occur (Letz in Lustyk & Doležal 2019). Until recently, these plants were erroneously referred to as *A.* ×*ozanonii* (e.g. Pyšek et al. 2012b, Jehlík in KČR 2), which is the correct name for plants derived from the parentage *A. hybridus* × *A. retroflexus*. Therefore, this is not a reidentification of the parentage but only a correction of the binomial.

Amaranthus ×turicensis (*A. cruentus* × *A. retroflexus*) → ***A.* ×*zobelii***. (*A. hypochondriacus* × *A. retroflexus*). The parentage of these hybrid plants of *A. retroflexus* was reassessed. Their first parent is *A. hypochondriacus*, which is cultivated in the Czech Republic as an ornamental, and not the tropical species *A. cruentus*, which has not been found here in cultivation or escaped. These two species are similar and have often been confused in central-European countries. Consequently, the correct name of the hybrid is *A.* ×*zobelii*. Such hybrid plants were recorded in the village of Všejany in central Bohemia in 1934 and in the village of Lužnice in southern Bohemia in 1976 (Letz in Lustyk & Doležal 2019). However, some specimens of the putative *A.* ×*turicensis* have not been newly examined yet, e.g., a single specimen collected in the private garden of B. Fleischer in the village of Sloupnice in eastern Bohemia in 1909 (Jehlík in KČR 2) and voucher specimens of hybrids studied by Lanta et al. (2003).

***Anthemis cretica* subsp. *columnae* → *A. cretica*.** The taxonomy of this mainly Mediterranean species is still unresolved. The Euro+Med PlantBase recognizes 30 subspecies and "species" (due to lack of the corresponding name at the subspecies level) within *A. cretica*. In the Flora of the Czech Republic (Dvořáková in KČR 7) and the 2nd edition of this catalogue (Pyšek et al. 2012b), plants recorded in Bohemia in the late 19th century were assigned to *A. cretica* subsp. *columnae*. However, their taxonomic identity requires further study (J. Prančl in litt.). Therefore, we classify them only at the species level.

***Astragalus alopecuroides* → *A. alopecurus*.** *Astragalus alopecurus* has a large range in the mountains in the temperate zone of western and central Siberia, Kazakhstan and north-western China. It is also found in the Caucasus Mts, Anatolia, the Rodopi Mts in Bulgaria and the Western Alps in France. A single plant of this species, rather deliberately planted than accidentally introduced, was collected in 1872 near the village of Hlubočepy, now Prague's city district, by L. J. Čelakovský and identified as *A. alopecuroides* (Kaplan & Danihelka in Kaplan et al. 2016b). Under this name, the species has been listed in the Czech botanical literature (e.g. Chrtková in KČR 4). Based on the typifications of both names concerned, the correct name for the plant once recorded in this country is *A. alopecurus*, while the name *A. alopecuroides* refers to the species native to the Iberian Peninsula and north-western Africa (Kaplan & Danihelka in Kaplan et al. 2016b).

***Beta vulgaris* Altissima Group → *B. vulgaris* Altissima Group** p.p. and ***B. vulgaris* weedy populations of hybrid origin.** For this taxon, it was necessary to separate the annual weed genotypes of beet, which are invasive, from cultivated sugar beet, which is closely related but escapes only casually. The *Beta vulgaris* complex is fully cross-compatible and includes cultivated, weedy, ruderal and seashore beets. The weed beet has evolved through multiple hybridizations of cultivars (mainly sugar beet) with wild ruderal beet populations found in the interior of western Europe (Fénart et al. 2008). Therefore, cultivated, ruderal and weed beets are genetically close to each other, even closer than their presumed common ancestor, i.e. wild populations of sea beet that occur in the Mediterranean area. For this reason, the difference between weed beets and cultivated beets could not be defined taxonomically, and we chose the informal designation given above.

***Brassica napus* Napus Group → *Brassica napus*.** Two cultivar groups are distinguished by Zelený (in Kaplan et al. 2019a). Of these, *B. napus* Napus Group occasionally escapes from cultivation (Pyšek et al. 2012b). The same can be assumed for *B. n.* Napobrassica Group, which has been commonly cultivated as a very undemanding crop, but escaped plants have never been recorded. The lower taxa are not distinguishable in the archaeobotanical record (CZAD database). Due to these information gaps, we classify *B. napus* only at the species level.

***Bromus rigidus* → *B. diandrus*.** *Bromus diandrus* and *B. rigidus* are similar and closely related taxa differing in a few, mainly quantitative characters. However, the two ploidy levels (hexaploid and octoploid) found within these species do not correlate with morphological characters (Oja & Laarmann 2002). Here we accept only one species with two varieties. In this broad circumscription, the correct species' name is *B. diandrus*. Most of the plants collected in this country correspond to var. *diandrus* (Chrtek & Danihelka in Kaplan et al. 2022).

***Centaurea nigra* → *C. nigra* agg.** *Centaurea nigra* agg. includes *C. nigra*, *C. nemoralis* and some other poorly known taxa distributed mainly in western Europe. There are two ploidy levels, probably not correlated with the morphological characters of two main species usually recognized, and the whole group is in need of a taxonomic revision (P. Koutecký in litt.). The introduced plants found in the Czech Republic morphologically approach *C. nemoralis*, but plants referable to *C. nigra* have been recorded as well; in addition, the variation of the group is further inflated by the introgression of *C. jacea*. In contrast to the 2nd edition of this catalogue (Pyšek et al. 2012b), where all records were assigned to *C. nigra*, we accommodate these plants within the *C. nigra* aggregate.

***Chloris radiata* → *C. virgata*.** *Chloris radiata* was reported as introduced in 1958–1961 to gardens in the city of Brno, fertilized with waste from wool sorting and cleaning (Dvořák & Kühn 1966). An examination of the voucher specimen showed that it was actually *C. virgata* (Kaplan in Hadinec & Lustyk 2014).

***Corispermum declinatum* → *C. gmelinii*.** *Corispermum declinatum* was listed in the 2nd edition of this catalogue (Pyšek et al. 2012b) based on two gatherings from a waste disposal place in Stodůlky in the south-western outskirts of Prague (both Hejný 1960 PR). A re-examination of these specimens has shown that they represent the similar and probably closely related *C. gmelinii* (Danihelka in Hadinec & Lustyk 2013).

Eragrostis gracilis* → *E. pilosa. This name was used by Jirásek (1952) for plants collected in the city of Olomouc by H. Laus and J. Otruba in 1937 and 1942, respectively. Such a taxon was included among the introduced species of the genus *Eragrostis*, for instance, by Smejkal (1980), Dostál (1989) and Pyšek et al. (2002, 2012b). In new taxonomic sources (e.g. Peterson et al. 2001), the name *E. gracilis* is considered a synonym of the name *E. pilosa*.

***Erigeron annuus* subsp. *annuus* and *E. a.* subsp. *septentrionalis* → *E. annuus*.** In the recent literature, two subspecies have been recognized in central and western Europe, namely *E. annuus* subsp. *annuus* and *E. a.* subsp. *septentrionalis* (e.g. Šída in KČR 7, Pyšek et al. 2012b, Šída in Kaplan et al. 2019a). However, this classification does not reflect the morphological variation pattern of the triploid apomictic populations found in central Europe (O. Šída in litt.). Therefore, we classify these populations only at the species level.

Eriochloa punctata* → *E. procera. *Eriochloa* plants were found at two sites in the city of Brno, in gardens fertilized with waste from wool sorting and cleaning (1960) and at a railway station (1965). Three names were proposed for these plants in the literature: *E. ramosa*, *E. punctata* and *E. procera* (Dvořák & Kühn 1966, Grüll 1979, Smejkal 1980, Dostál 1982, 1989). All voucher specimens deposited in BRNU were identified as *E. punctata* by J. Dvořák, and this name was adopted for the second edition of the Catalogue of alien plants of the Czech Republic (Pyšek et al. 2012b). However, during the revision of alien grasses for the Flora of the Czech Republic, we also studied the collections of J. Dvořák now deposited in BRA. A re-examination of all voucher specimens of *Eriochloa* collected in Brno revealed that they all belong to a single species, *E. procera* (Kaplan & Danihelka in Hadinec & Lustyk 2014). *Eriochloa ramosa* is currently considered a synonym of *E. procera* (Zuloaga & Morrone 2003, Chen & Phillips 2006).

***Fumaria officinalis* subsp. *officinalis* and *F. o.* subsp. *wirtgenii* → *F. officinalis*.** Both subspecies are reported to occur in the Czech Republic (e.g. Smejkal in KČR 1, Danihelka in Kaplan et al. 2019a). These two taxa differ morphologically and in their ploidy levels (tetraploid vs hexaploid). However, the plants traditionally referred to *F. officinalis* subsp. *wirtgenii* do not correspond to the descriptions in western European floras (e.g. Müller et al. 2021), and there are no records of hexaploid plants from the Czech Republic. Therefore, we classify *F. officinalis* only at the species level.

***Fumaria vaillantii* subsp. *vailantii* and *F. v.* subsp. *schrammii* → *F. vaillantii*.** *Fumaria vaillantii* subsp. *schrammii* is reported to occur at a few sites in southern Moravia (Smejkal in KČR 1). However, a clear-cut separation of this morphological variant with subsessile racemes from *F. vaillantii* subsp. *vaillantiii* seems impossible. More likely, such plants may represent an extreme part of the variation of a single taxon. For this reason, we classify *F. vaillantii* only at the species level.

Leptochloa panicea* subsp. *brachiata* → *L. divaricatissima, native to eastern Australia, was collected in 1960 in gardens in the city of Brno, fertilized with waste from wool sorting and cleaning (Kaplan in Hadinec & Lustyk 2014). The specimens were previously misidentified as *L. mucronata* by J. Dvořák and under this name reported by Dvořák & Kühn (1966), Grüll (1979) and Smejkal (1980). Following an update of nomenclature (Snow 1998, 2003), the name *L. panicea* subsp. *brachiata* was applied by Danihelka et al. (2012) and Pyšek et al. (2012b) to the plants previously reported from the Czech Republic as *L. mucronata* and *L. filiformis*. However, an examination of the voucher specimens showed that they belong to *L. divaricatissima*. No specimens of *L. panicea* (syn. *Dinebra panicea*) were found among the studied material, and the records are therefore erroneous (Kaplan in Hadinec & Lustyk 2014).

***Lilium bulbiferum* → *L. bulbiferum* var. *bulbiferum*.** The populations found in the wild usually form large numbers of bulbils, while only some individuals form flowers. However, these plants are autosterile, and plants regenerate only vegetatively. In contrast, the cultivated individuals, classified as *L. bulbiferum* var. *croceum*, do not form bulbils and have not been recorded in the wild yet (Hrouda in KČR 8). While *L. bulbiferum* was included at the species level in the second edition of this catalogue (Pyšek et al. 2012b), here we include only its type variety.

***Oxalis corniculata* var. *corniculata* and *O. c.* var. *repens* → *O. corniculata*.** We refrained from classifying *O. corniculata* var. *corniculata* and *O. c.* var. *repens* separately (cf. Pyšek et al. 2012b). The latter includes mainly cultivars with leaves with a reddish-violet tint originally cultivated as an ornamental and massively spreading in settlements and graveyards, often unintentionally introduced with potted plants from garden centres and plant nurseries. Green-leaved plants with a slightly more erect growing habit are rather rare, and intermediates also exist.

Papaver atlanticum **subsp.** ***mesatlanticum*** **→** ***P. atlanticum*****.** In contrast to the 2nd edition of the catalogue (Pyšek et al. 2012b), we classify the taxon only at the species level, following Kubát (in Kaplan et al. 2019a). The vast majority of the taxonomic sources do not distinguish the intraspecific taxa within this species, and the escaped plants are of garden origin, with characters altered by breeding.

Peucedanum austriacum p.p. **→** ***P. austriacum*** **subsp.** ***rablense*****.** In both earlier editions of this catalogue (Pyšek et al. 2002, 2012b) and in the Flora of the Czech Republic (Grulich in KČR 5), the only record of this subspecies from Bohemia, based on a single gathering from 1837 near the village of Hlubočepy, now Prague's city district, was included at the species level, i.e. under *P. austriacum*. However, it was originally assigned to this subspecies (Čelakovský 1875), which was confirmed recently (Marek et al. 2015).

Prunus ×fruticans **→** ***P. spinosa*** **subsp.** ***fruticans.*** This taxon was formerly classified at the species level as *P. ×fruticans*, assumed to be derived from the cross *P. insititia* × *P. spinosa*. However, these tall shrubs with rather large fruits with less astringent taste are now included at the subspecies level within *P. spinosa* (Sádlo in Kaplan et al. 2019a).

Pseudotsuga menziesii p.p. **→** ***P. menziesii*** **var.** ***menziesii*****.** In contrast to the 2nd edition of this catalogue (Pyšek et al. 2012b), we classify separately *P. menziesii* var. *menziesii* and *P. m.* var. *glauca*. While the former is frequently planted both as an ornamental and in forests and already locally established, the latter is planted mainly for ornament and regenerating only rarely.

Rumex longifolius **subsp.** ***longifolius*** and ***R. l.*** **subsp.** ***sourekii*** **→** ***R. longifolius***. In contrast to the 2nd edition of this catalogue (Pyšek et al. 2012b), we do not classify the two subspecies separately. Even though they are distinguished in the latest literature (e.g. Kubát in Kaplan et al. 2019a), most of the available field records are only at the species level. This renders a reliable assessment of these taxa impossible. According to the Pladias database, the invasive spread of *R. l.* subsp. *sourekii* has always been questionable. Currently, the populations of this species are naturalized but not invasive.

Setaria italica **subsp.** ***italica*** and ***S. i.*** **subsp.** ***moharia*** **→** ***S. italica.*** In this edition of the catalogue, we have refrained from including two lower taxa, which in fact represent only two groups of cultivars.

Spiraea ×billardii p.p. **→** ***S. ×pseudosalicifolia*** is an artificial hybrid between the North American *S. douglasii* and the circumpolar *S. salicifolia* (Silverside 1990). Until recently, plants of this parentage were included in the widely circumscribed *S. ×billardii*. This shrub spreads as a remnant of old plantings in moist forest edges, on roadsides, in urban habitats, and along watercourses. In the Czech Republic, it was first recorded as escaped from cultivation in 1946 near the village of Malá Morávka in northern Moravia. Nowadays, records of escaped specimens exist from 15 grid-cell quadrants (Businský & Velebil in Kaplan et al. 2023).

Sporobolus indicus **→** ***S. elongatus***. *Sporobolus indicus* was reported as introduced with wool into the city of Brno (Dostál 1989, Conert 1998, Danihelka et al. 2012, Pyšek et al. 2012b). However, a re-examination of the voucher specimens showed that they actually belong to *S. elongatus* (Kaplan in Hadinec & Lustyk 2014).

Valerianella dentata **subsp.** ***dentata*** and ***V. d.*** **subsp.** ***eriosperma*** **→** ***V. dentata.*** In contrast to the 2nd edition of the catalogue (Pyšek et al. 2012b), we do not classify plants with hairy fruits (*V. dentata* subsp. *eriosperma*) and glabrous fruits (*V. d.* subsp. *dentata*) separately even though both morphological variants are still separated at the subspecies level by Kirschner (in Kaplan et al. 2019a). The taxonomic value of this character is rather low as similar variation is also found in some other species of the genus. In the Czech Republic, plants with hairy fruits are more or less restricted to warm and dry areas, where they co-occur with plants with glabrous fruits. However, they do not differ in their invasion status.

Veronica peregrina **subsp.** ***peregrina*** **→** ***V. peregrina*****.** Here we do not distinguish between completely glabrous plants, *V. peregrina* var. *peregrina*, and pubescent ones, *V. p.* var. *xalapensis* (cf. Danihelka in Kaplan et al. 2019a). Plants referable to *V. p.* var. *xalapensis*, neglected until recently, are less frequent than those completely glabrous ones, but they do not differ in any other respect and do not merit a separate classification. In contrast to the earlier editions of this catalogue (Pyšek et al. 2002, 2012b), which included *V. peregrina* subsp. *peregrina*, we classify *V. peregrina* only at the species level.

Xanthium orientale (s. str.) **→** ***X. saccharatum*** (→ neo cas) was collected from ruderal sites in the cities of Brno, Pardubice and Olomouc between 1965 and 1983. However, these plants were later identified as *X. orientale* (cf. Havlíček in KČR 7). Only recently, they were revised as *X. saccharatum*, which is another member of the *X. orientale* agg. These occurrences turned out to be temporary. In 2008, *X. saccharatum* was first observed as a weed in maize and sunflower fields near the town of Hrušovany nad Jevišovkou in southern Moravia, probably introduced with contaminated commercial seed from abroad (Danihelka & Dřevojan in Kaplan et al. 2021).

TAXA FROM PREVIOUS EDITION REMOVED HERE (in total 35 taxa)

(a) Reclassified as native (16 taxa)

Agrostis gigantea (nat neo → native). Based on a re-evaluation of its distribution and habitat preferences, at least some populations may be considered native (Štech in Kaplan et al. 2019a, Štech in litt.).

Atriplex tatarica (nat ar → native) was previously considered alien (Kirschner & Tomšovic in KČR 2, Pyšek et al. 2002, 2012b) due to its common occurrence in ruderal habitats and continental distribution in Europe. However, we found no substantial arguments for its alien status. The north-western border of its current continuous European range passes through southern Moravia. The species has been recorded here since the beginning of floristic research from natural saline habitats. It is also assessed as native to this area in the monograph by Kochánková & Mandák (2008).

Chelidonium majus*, *Lapsana communis* subsp. *communis (both taxa: nat ar → native). These nitrophilous shade-tolerant herbs have similar habitat requirements as *Galeopsis tetrahit* agg., *Galium aparine* and *Geranium robertianum*, whose native status in central Europe has never been questioned. *Chelidonium majus* was first recorded in the Czech Republic in the Eneolithic, but has been repeatedly documented from western Slovakia (Hájková et al. 2013) since the Neolithic and from the Moravský kras karst area (Kasprowska et al. 2007) since the Bronze Age in completely natural vegetation. At the same time, macrofossils of these species have not been found in the area of the origin of agriculture. *Lapsana communis* was recorded in central and western Europe in the Mesolithic and earliest Neolithic (Rulf & Tempír 2002, Jacomet & Vandorpe 2022). This shows that the residence times of these species are pre-Neolithic and they should not be considered aliens.

Crocus vernus (neo cas → native). We reclassify this species as native because a critical revision of its distribution (Chrtek in Kaplan et al. 2016b) raised doubts about whether the species is truly introduced throughout its distribution range in the Czech Republic. Its native range here reaches its northern limit; the species' occurrences in southern Bohemia (Šumava Mts and Novohradské hory Mts) and also in eastern Moravia near the town Valašské Klobouky may be considered native.

Fallopia convolvulus*, *Fallopia ×convolvuloides*, *Geranium columbinum*, *Matricaria chamomilla*, *Myosotis arvensis* subsp. *arvensis*, *Myosotis ×krajinae*, *Myosotis ×pseudohispida*, *Solanum nigrum*, *Viola tricolor* subsp. *tricolor (all taxa: nat ar → native). These annual mesophilous herbs were long thought to be archaeophytes introduced with ancient agriculture from the Mediterranean. However, these taxa are also able to survive under a variety of natural disturbances, and their ranges are European or even Eurasian rather than Mediterranean. *Fallopia convolvulus* and *Solanum nigrum* were recorded as early as the Mesolithic from northern Europe (Bos et al. 2006, Bishop et al. 2014). Therefore, we assess them as native, similar to, e.g., *Chenopodium album*.

Fallopia ×convolvuloides (nat ar → native). See *Fallopia convolvulus* for reclassification of the species as native.

Geranium columbinum (nat ar → native). See *Fallopia convolvulus* for reclassification of the species as native.

Lapsana communis* subsp. *communis (nat ar → native). See *Chelidonium majus* for reclassification of the species as native.

Matricaria chamomilla (nat ar → native). See *Fallopia convolvulus* for reclassification of the species as native.

Myosotis arvensis* subsp. *arvensis (nat ar → native). See *Fallopia convolvulus* for reclassification of the taxon as native.

Myosotis ×krajinae (nat ar → native). See *Fallopia convolvulus* for reclassification of the taxon as native.

Myosotis ×pseudohispida (nat ar → native). See *Fallopia convolvulus* for reclassification of the taxon as native.

Solanum nigrum (nat ar → native). See *Fallopia convolvulus* for reclassification of the species as native.

Stellaria pallida (ar → native). Our review of the available data found that there is insufficient evidence to support the alien status of this species. It is native from the northern temperate to meridional floristic zones of Europe and widely naturalized outside this range. Godwin (1975) reports a record of *S. pallida* from the latest (Eemian) interglacial in Great Britain. This suggests that this species is neither a modern European species of Holocene origin nor an archaeophytic ruderal migrant. In central Europe, this species prefers dry but not necessarily climatically warm habitats that are disturbed and nutrient-rich but not always human-made (Hügin 2012). It grows in similar conditions to other native winter annuals such as *Arenaria serpyllifolia*, *Poa annua*, *Sagina procumbens*, *Stellaria media* and *Valerianella locusta*. These species spread easily and had ample time to spread spontaneously from their glacial refugia before the formation of the cultural landscape. Although the CZAD database lists *S. pallida* only from the Medieval period, its native relative, *S. media,* also has only three prehistoric records among a total of 50 localities.

Trifolium pratense **Americanum Group** (cas neo), ***T. pratense*** **Sativum Group** (cas neo) → ***Trifolium pratense*** (native). The species is very variable in appearance and size, and the two cultivar groups, which were previously considered subspecies, differ little from the wild forms. Due to their low taxonomic status, we newly classify *T. pratense* only at the species level; the species is native to the flora of the Czech Republic.

Viola tricolor **subsp.** ***tricolor*** (nat ar → native). See *Fallopia convolvulus* for reclassification of the taxon as native.

Lapsana communis **subsp.** ***communis*** (nat ar → native). See *Chelidonium majus* for reclassification of the taxon as native.

(b) not escaping from cultivation (8 taxa)

Amaranthus acutilobus was once cultivated in the botanical garden of Charles University in Prague, where it temporarily escaped at the beginning of the 20th century. However, such escapes, which took place directly within the cultural habitat of gardens under the constant assistance of humans, cannot be considered as an indication of alien status.

Amaranthus cruentus. As in other central-European countries, this name has been misapplied in the Czech Republic to the similar *A. hypochondriacus*. A revision of herbarium specimens showed that the tropical *A. cruentus* has never been cultivated nor escaped in this country (Letz in Lustyk & Doležal 2019).

Briza minor was reported as introduced into the town of Kuřim in 1963 (Dvořák & Kühn 1966). Spontaneous occurrence, however, has never been recorded in the Czech Republic, and the cited record was only a result of deliberate sowing with waste from wool sorting and cleaning spread on a private experimental plot.

Coleostephus myconis. This annual species of Mediterranean origin was once cultivated in the Czech Republic as an ornamental. However, Zelený (in KČR 7) pointed out that the cultivation of this species was unique. Currently, its seeds are not available on the Czech market. Escapes of cultivated populations are possible, but there is no evidence that they have ever occurred.

Onopordum ×beckianum (*O. acanthoides* × *O. illyricum*). This hybrid was collected in 1906 in the university botanical garden in Prague, where both parental species were cultivated (Sutorý 2001). The details are unknown, but we do not consider such a single record of a hybrid plant from a botanical collection an escape from cultivation. Its inclusion into the first edition of this catalogue (Pyšek et al. 2002) was rather a mistake to be corrected here.

Pinguicula grandiflora **subsp**. ***rosea*** was reported in the 2nd edition of this catalogue (Pyšek et al. 2012b) as probably deliberately planted, together with *P. crystallina* subsp. *hirtiflora*, on a tufa cascade in a forest near the village of Tichá in the Beskydy Mts, northern Moravia. While the latter taxon has formed a large population there since then, the plants of *P. grandiflora* subsp. *rosea* have probably vanished soon after they were planted and, therefore, are not classified here as naturalized or spontaneously escaping from cultivation.

Salvia splendens. This species, native to Brazil, was allegedly observed in the 1990s at two sites in the city of Plzeň in western Bohemia (Chocholoušková & Pyšek 2003). The circumstances of these records are not described, and, in addition, *S. splendens* is not listed among the “new species of Plzeň’s ruderal flora” in p. 40–42 of the cited report. We remove it from the 3rd edition of this catalogue due to a lack of evidence.

Spiraea hypericifolia* subsp. *obovata was once found near the village of Vlastislav in northern Bohemia and recorded as escaping (Pyšek et al. 2012b), but it was probably only a remnant of earlier cultivation.

(c) taxonomically not justified taxa (4)

×Anthematricaria dominii (*Anthemis cotula* × *Matricaria chamomilla*) was reportedly recorded in the village of Zlíchov, now part of Prague (Rohlena 1930). The type specimen was recently examined by J. Prančl (in litt.), who concluded that it corresponds to *Matricaria chamomilla*. It bears no morphological characters of *A. cotula* nor any other characters suggesting its hybrid origin. No other records exist from this country.

Geum ×gajewskii. Under this name, a hybrid was described from the city of Brno with the assumed parentage of *G. macrophyllum* × *G. urbanum* (Smejkal 1959). However, the specimens at BRNU marked by Smejkal as the holotype and isotypes represent *G. aleppicum*, while other authentic specimens are a mixture of plants referable to *G. aleppicum*, the native *G. urbanum* and their hybrid, *G. ×spurium* (Wilcox 2015).

Malus pumila is a taxon of unclear origin, reportedly introduced to Europe from the Southern Caucasus where it does not, however, occur in the wild (Dostálek in KČR 3). At present, it is mostly planted as a rootstock for *M. domestica* and rarely reported as escaped in the floristic literature from various parts of the country (Křivánek 2008). However, these records require reassessment. Because of taxonomic uncertainty and lack of reliable records, we include these records in *M. domestica*.

Tragopogon ×mirabilis (*T. porrifolius* × *T. pratensis*) was once recorded from the town of Roudnice nad Labem in northern Bohemia (Novák 1922). A large population of plants that are extremely variable in their morphology and fertility occurs there now (Krahulec et al. 2005). Molecular investigation of plants from this population revealed that it includes a so far unrecognized diploid species from the *Angustissimi* clade, which is distributed mainly in the Caucasus Mts, and hybrids of this unknown species with *T. orientalis* (Mavrodiev et al. 2013). The taxonomy of this group and the exact identity of the plants growing in the town of Roudnice nad Labem require further study.

(d) doubtful records (6 taxa)

Alchemilla sericata, native to the Caucasus Mts, is sometimes cultivated in rock gardens as an ornamental. It is reported by Plocek (in KČR 4) as "once probably escaped from cultivation in the village of [Velká?] Chuchle", now Prague's city district, with no details available. The species, included in both earlier editions of this catalogue (Pyšek et al. 2002, 2012b), has been removed from this edition due to lack of evidence.

Astragalus glycyphylloides was reported as introduced into the village of Tuřany (Dostál 1989, Chrtková in KČR 4, Pyšek et al. 2002), now part of the city of Brno. However, no herbarium specimen was found in relevant herbaria despite targeted searches.

Euphorbia chamaesyce (syn. *Chamaesyce canescens*) was reported as introduced from Prague and the city of Pardubice by Dostál (1989) and Chrtek & Křísa (in KČR 3). However, no herbarium specimens were found during a large-scale revision of *Euphorbia* herbarium specimens in Czech herbaria. These records are most likely erroneous, based on misidentifications of *E. maculata*.

Plantago gentianoides, native to the mountains in the Balkan Peninsula, is reported as once deliberately planted in the wild near the village of Zákolany in central Bohemia (Dostál 1989, Chrtek sen. in KČR 6). No further information is available, and the corresponding herbarium specimen has not been found. This species is excluded from this edition of the catalogue due to the lack of evidence.

Scirpus pendulus was reported as introduced from southern Bohemia (Dostál 1989). Based on this record, it was listed in both earlier editions of this catalogue (Pyšek et al. 2002, 2012b). However, no herbarium specimen has been found, and the species is excluded for the lack of evidence.

Sium sisarum was once reported to occur around the city of Olomouc, less frequently than *S. latifolium*, "especially in railway ditches" near the village of Holice (Mik 1860). This record was later accepted in some floras (e.g. Dostál 1989) and also by Pyšek et al. (2002, 2012b). However, the occurrence of *S. sisarum* near Olomouc has not been confirmed since then, and no herbarium specimen has been found. Along with the fact that the author of the local flora was a 20-year-old student with limited expertise, this renders the single record of *S. sisarum* from our country doubtful.

Appendix 2. List of alien taxa of the Czech flora (see Supplementary Table S3 for electronic version). Taxa are arranged alphabetically. **Family** codes (Fam) are formed by the initial letters of the family name using APGIII system (Angiosperm Phylogeny Group 2009). The following information is given for each taxon: **Residence time category** (Res): ar = archaeophyte, neo = neophyte, with a more detailed classification as introduced in Table 2. **Invasion status** (Inv): cas = casual, nat = naturalized, inv = invasive. **First record** (1st): year of the first reported occurrence in the wild in the Czech Republic. **Last record** (LR): year of the last reported occurrence (up to 2000). **Region of origin**: M – Mediterranean region, E – Europe, As – Asia, Af – Africa, AmN – North America, AmC – Central America, AmS – South America, Au – Australia, hybrid – hybrid origin, anec –anecophyte (see text for details). **Occupancy** (Occup): number of grid cells of 10' (longitude) × 6' (latitude), corresponding to ~12.0 × 11.1 km, from which the species is reported (n = 679). Note that in some taxa at the subspecies rank, the number of grid cells may be underestimated because some occurrence records are reported at the species level. For precise distributions, see Kaplan et al. 2015, 2016a, b, 2017a, b, 2018a, b, 2019, 2020, 2021, 2022, 2023). **Source:** Literature first reporting the species or explicitly dealing with the given taxon; also included are selected comprehensive accounts and specialized case studies or recent updates. References to the nine volumes of the Flora of the Czech Republic are indicated using codes: KČR 1 – Hejný & Slavík 1988, KČR 2 – Hejný & Slavík 1990, KČR 3 – Hejný & Slavík 1992, KČR 4 – Slavík 1995, KČR 5 – Slavík 1997, KČR 6 – Slavík 2000, KČR 7 – Slavík & Štěpánková 2004, KČR 8 – Štěpánková 2010, KČR 9 – Štěpánková 2023. If the taxon is referred for the first time in this edition of the catalogue (compared to Pyšek et al. 2012b), it is marked as "this study" in the Source column alongside with the literature in which it was reported first; those taxa that only have "this study" in the source column are reported as alien in the Czech Republic here for the first time. Taxa that were subject to changes in invasion status or nomenclature and marked with an asterisk in the same column; all taxa with the asterisk are dealt with in detail in Appendix 1.

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Abies concolor	(Gordon et Glend.) Hildebr.	Pina	neo 4	cas			AmN	59	Pyšek et al. 2012b
Abies grandis	(D. Don) Lindl.	Pina	neo 4	cas			AmN	151	Pyšek et al. 2012b
Abies nordmanniana	(Steven) Spach	Pina	neo 4	cas			E	41	Pyšek et al. 2012b
Abutilon theophrasti	Medik.	Malv	neo 2	inv	1894		M As	143	Domin 1918, Šumberová et al. in Kaplan et al. 2020*
Acaena microphylla	Hook. f.	Rosa	neo 4	cas	1947		Au	1	Domin 1949, Sádlo in Lustyk & Doležal 2022, this study*
Acanthus hungaricus	(Borbás) Baen.	Acan	neo 3	cas	1999		E	1	Hadinec in Hadinec & Lustyk 2009
Acer ginnala	Maxim.	Sapi	neo 4	cas	2001		As	24	Pyšek et al. 2002
Acer monspessulanum	L.	Sapi	neo 4	cas	2001		M	2	Pyšek et al. 2002
Acer negundo	L.	Sapi	neo 2	inv	1875		AmN	355	Koblížek in KČR 5
Acer saccharinum	L.	Sapi	neo 3	cas			AmN	74	Koblížek in KČR 5
Acer tataricum	L.	Sapi	neo 4	nat	2004		E	66	Koblížek in KČR 5, Čáp & Koblížek in Hadinec et al. 2005, Pyšek et al. 2012b*
Achillea crithmifolia	Waldst. et Kit.	Aste	neo 2	cas	1886		E M	5	Danihelka in Kaplan et al. 2019b
Achillea filipendulina	Lam.	Aste	neo 2	cas	1945		E M	2	Sutorý 1993, Danihelka in KČR 7
Achnatherum calamagrostis	(L.) P. Beauv.	Poac	neo 2	cas	1908	1908	E M	1	Kaplan et al. 2019a
Aconitum ×cammarum	L.	Ranu	neo 2	nat	1819		anec	47	Skalický in KČR 1
Acorus calamus	L.	Acor	neo 1	nat	1679		As	487	Kaplan in Kaplan et al. 2016a
Actinidia deliciosa	(A. Chev.) C. F. Liang et A. L. Ferguson	Acti	neo 4	cas	2008		As	2	Hadinec et al. in Hadinec & Lustyk 2008
Adiantum capillus-veneris	L.	Pter	neo 4	cas	2022		E M AmN & C & S As Af Au	1	Ekrt in Lustyk & Doležal 2022, this study*
Adonis aestivalis subsp. *aestivalis*	L.	Ranu	ar BR	nat			M	219	Křísa in KČR 1
Adonis annua subsp. *annua*	L.	Ranu	neo 2	cas	1874		M	2	Křísa in KČR 1
Adonis flammea	Jacq.	Ranu	ar *	cas			M	69	Křísa in KČR 1, Fajmon in Hadinec et al. 2005, Štefánek in Hadinec et al. 2005
Aegilops cylindrica	Host	Poac	neo 3	cas	1957		M	16	Kühn 1970, Zázvorka in Kaplan et al. 2015
Aegilops geniculata	Roth	Poac	neo 2	cas	1920	1920	M	1	Kaplan et al. 2019a
Aesculus ×carnea	Hayne	Sapi	neo 3	cas	1963		anec	23	Pyšek et al. 2002
Aesculus hippocastanum	L.	Sapi	neo 1	nat			M	550	Skalická in KČR 5
Ageratina altissima	(L.) R. M. King et H. Rob.	Aste	neo 3	cas	1979		AmN	1	Slavík in KČR 7
Ageratum houstonianum	Mill.	Aste	neo *	cas			AmC AmS	1	Bělohlávková in KČR 7
Agrostemma githago	L.	Cary	ar NE	nat			anec	357	Kaplan & Danihelka in Kaplan et al. 2022*
Agrostis scabra	Willd.	Poac	neo 4	nat	2001		AmN	2	Pyšek et al. 2002
Ailanthus altissima	(Mill.) Swingle	Sima	neo 2	inv	1874		As	128	Koblížek in KČR 5

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Aira elegantissima	Schur	Poac	neo 2	cas	1853	1941	E M	2	Kaplan in Lustyk & Doležal 2020, this study*
Ajuga chamaepitys subsp. *chamaepitys*	(L.) Schreb.	Lami	ar IR	nat			M	68	Slavíková in KČR 6
Ajuga chamaepitys subsp. *chia*	(Schreb.) Arcang.	Lami	ar *	cas			E M	1	Slavíková in KČR 6
Alcea rosea	L.	Malv	ar/neo	nat	1880		anec	51	Slavík in KČR 3
Alchemilla conjuncta	Bab.	Rosa	neo 2	cas			E	2	Plocek in KČR 4, Havlíček 1999
Alchemilla mollis	(Buser) Rothm.	Rosa	neo 3	cas	1985		E As	8	Plocek in KČR 4
Alchemilla speciosa	Buser	Rosa	neo *	cas			E	1	Plocek in KČR 4
Alchemilla tytthantha	Juz.	Rosa	neo *	cas			E	1	Plocek in KČR 4
Alhagi maurorum	Medik.	Faba	neo 3	cas	1963		E M As	1	Pyšek et al. 2002
Allium atropurpureum	Waldst. et Kit.	Amary	neo 2	cas	1946		E	1	Pyšek et al. 2002, Krahulec & Duchoslav in KČR 8
Allium atroviolaceum	Boiss.	Amary	neo 3	cas	1922		E M	1	Pyšek et al. 2002, Krahulec & Duchoslav in KČR 8
Allium caeruleum	Pall.	Amary	neo 4	cas	2017		E As	1	Uher in Lustyk & Doležal 2019, this study*
Allium cepa	L.	Amary	ar LM	cas			M	27	Krahulec & Duchoslav in KČR 8
Allium cristophii	Trautv.	Amary	neo 3	cas	1994		M As	5	Krahulec in Hadinec & Lustyk 2009, Krahulec & Duchoslav in KČR 8
Allium fistulosum	L.	Amary	ar/neo	cas			As	1	Krahulec & Duchoslav in KČR 8
Allium fuscum	Waldst. et Kit.	Amary	neo 4	cas	2014		E M	1	Krahulec & Sádlo in Lustyk & Doležal 2020, this study*
Allium moly	L.	Amary	neo 3	cas			M	2	Krahulec & Duchoslav in KČR 8
Allium paradoxum var. *paradoxum*	(M. Bieb.) G. Don	Amary	neo 2	inv			As	2	Lustyk & Doležal in Lustyk & Doležal 2018, Krahulec & Duchoslav in KČR 8*
Allium porrum	L.	Amary	ar/neo	cas			anec	1	Krahulec & Duchoslav in KČR 8
Allium roseum	L.	Amary	neo 4	cas	2005		M	1	Krahulec & Lepší in Hadinec & Lustyk 2009, Krahulec & Duchoslav in KČR 8
Allium sativum	L.	Amary	ar/neo	nat			anec	40	Krahulec & Duchoslav in KČR 8
Allium stipitatum	Regel	Amary	neo 4	cas	2008		As	2	Krahulec in Hadinec & Lustyk 2009, Krahulec & Duchoslav in KČR 8
Allium tuberosum	Spreng.	Amary	neo 2	cas	1866		M	1	Krahulec & Duchoslav in KČR 8
Allium zebdanense	Boiss. et Noë	Amary	neo 4	cas	2006		M	2	Krahulec & Marek in Hadinec & Lustyk 2006, Krahulec & Duchoslav in KČR 8
Alnus rugosa	(Du Roi) Spreng.	Betu	neo 2	cas	1872		AmN	3	Kovanda in KČR 2
Alopecurus myosuroides	Huds.	Poac	ar *	nat			M	87	Bureš & Danihelka in Kaplan et al. 2015
Alopecurus rendlei	Eig	Poac	neo 2	cas	1936	1937	E M	1	Danihelka in Kaplan et al. 2019a, this study*
Althaea armeniaca	Ten.	Malv	neo 3	cas	1966		M	1	Smejkal 1966, Slavík in KČR 3
Althaea hirsuta	L.	Malv	neo 2	cas	1870		M	2	Slavík in KČR 3
Althaea taurinensis	DC.	Malv	neo 4	cas	1857		E As	13	Hroneš & Király in Kaplan et al. 2019a, Hroneš in Lustyk & Doležal 2022, this study*
Alyssum murale	Waldst. et Kit.	Bras	neo 2	nat			M	8	Smejkal in KČR 3
Alyssum rostratum	Steven	Bras	neo 2	cas	1897		E	1	Smejkal in KČR 3
Amaranthus albus	L.	Amara	neo 2	inv	1893		AmN	165	Domin 1917*
Amaranthus blitoides	S. Watson	Amara	neo 2	nat	1931		AmN	30	Krkavec & Kilián 1964
Amaranthus blitum subsp. *blitum*	L.	Amara	ar EM	nat			M	153	Jehlík in KČR 2
Amaranthus bouchonii	Thell.	Amara	neo 2	nat	1948		AmN	6	Letz in Lustyk & Doležal 2019*
Amaranthus caudatus × *A. retroflexus*		Amara	neo 2	cas	1926	1966	hybrid	4	Letz in Lustyk & Doležal 2019*
Amaranthus caudatus subsp. *saueri*	V. Jehlík	Amara	neo 2	cas	1838		AmS	2	Jehlík in KČR 2
Amaranthus crispus	(Lesp. et Thévenau) N. Terracc.	Amara	neo 2	cas	1926	2020	AmS	4	Jehlík in KČR 2*
Amaranthus deflexus	L.	Amara	neo 2	nat	1905		AmS	6	Jehlík in KČR 2, Grüll 1999, Fajmon et al. in Hadinec & Lustyk 2008
Amaranthus emarginatus subsp. *emarginatus*	Uline et W. L. Bray	Amara	neo 3	nat	1994		AmS	2	Dřevojan & Letz 2016, this study*
Amaranthus emarginatus subsp. *pseudogracilis*	(Thell.) Hügin	Amara	neo 3	nat	1983		AmS	5	Dřevojan & Letz 2016, this study*
Amaranthus graecizans subsp. *graecizans*	L.	Amara	neo 2	cas	1912		M Af	1	Jehlík in KČR 2, Doležal in Lustyk & Doležal 2021
Amaranthus graecizans subsp. *sylvestris*	(Vill.) Brenan	Amara	ar EM	cas			M	6	Jehlík in KČR 2
Amaranthus graecizans subsp. *thellungianus*	(Nevski) Gusev	Amara	neo 3	cas	1965		M As	1	Jehlík in KČR 2
Amaranthus hybridus	L.	Amara	neo 3	cas	1957	1983	AmN & C & S	22	Letz in Lustyk & Doležal 2019

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Amaranthus hypochondriacus	L.	Amara	neo 2	cas	1853		anec	4	Letz in Lustyk & Doležal 2019
Amaranthus ×ozanonii	Thell.	Amara	neo 3	cas	1966	1971	hybrid	2	Letz in Lustyk & Doležal 2019, this study*
Amaranthus palmeri	S. Watson	Amara	neo 2	cas	1908		AmN	2	Jehlík in KČR 2
Amaranthus powellii	S. Watson	Amara	neo 2	inv	1853		AmC AmS	268	Hejný et al. 1973, Jehlík in KČR 2, Jehlík 1998
Amaranthus quitensis	Kunth	Amara	neo 2	cas	1910		AmS	1	Jehlík in KČR 2
Amaranthus ×ralletii	Contré	Amara	neo 4	cas	2005		hybrid	3	Letz in Lustyk & Doležal 2019, this study*
Amaranthus retroflexus	L.	Amara	neo 1	inv	1818		AmN AmC	440	Jehlík in KČR 2
Amaranthus rudis	J. D. Sauer	Amara	neo 3	cas	1967		AmN	2	Letz in Lustyk & Doležal 2019
Amaranthus ×soproniensis	Priszter et Kárpáti	Amara	neo 3	nat	1971		hybrid	11	Letz in Lustyk & Doležal 2019*
Amaranthus spinosus	L.	Amara	neo 2	cas	1909		AmC AmS	1	Jehlík in KČR 2
Amaranthus viridis	L.	Amara	neo 3	cas	1964		AmS	9	Hejný et al. 1973, Jehlík in KČR 2, Jehlík 1998
Amaranthus ×zobelii	Thell.	Amara	neo 2	cas	1934	1976	hybrid	2	Letz in Lustyk & Doležal 2019*
Ambrosia artemisiifolia	L.	Aste	neo 2	inv	1883		AmN	145	Hejný et al. 1973, Jehlík 1998, Slavík in KČR 7
Ambrosia psilostachya	DC.	Aste	neo 3	cas	1999		AmN	1	Červinka & Sádlo 2000, Slavík in KČR 7
Ambrosia trifida	L.	Aste	neo 3	cas	1960		AmN AmC	8	Dvořák & Kühn 1966
Amelanchier alnifolia	(Nutt.) M. Roem.	Rosa	neo 3	cas	2007		AmN	6	Lepší & Lepší 2008, Lepší & Lepší in Kaplan et al. 2016a
Amelanchier lamarckii	F. G. Schroed.	Rosa	neo 2	nat	1867		AmN	18	Lepší & Lepší 2008, Lepší & Lepší in Kaplan et al. 2016a*
Amelanchier spicata	(Lam.) K. Koch	Rosa	neo 2	nat	1880		AmN	45	Lepší & Lepší 2008, Lepší & Lepší in Kaplan et al. 2016a
Ammi majus	L.	Apia	neo 2	cas	1898		M	3	Tomšovic in KČR 5
Ammi visnaga	(L.) Lam.	Apia	neo 3	cas	1987		M	1	Tomšovic in KČR 5
Ammobium alatum	R. Br.	Aste	neo 2	cas	1942		Au	3	Hadač et al. 1994, Hradílek et al. 1999, Slavíková in KČR 7
Amorpha fruticosa	L.	Faba	neo 2	nat	1932		AmN	77	Chrtková in KČR 4
Amsinckia lycopsoides	(Lehm.) Lehm.	Bora	neo 4	cas	2000		AmN	2	Rotreklová & Řehořek in Hadinec & Lustyk 2009
Anacyclus clavatus	(Desf.) Pers.	Aste	neo 4	cas			M	1	Skalická in KČR 7
Anagallis arvensis	L.	Prim	ar NE	nat			M	575	Kovanda in KČR 3
Anagallis ×doerfleri	Ronniger	Prim	ar *	cas			hybrid	2	Kovanda in KČR 3
Anagallis foemina	Mill.	Prim	ar *	nat			E M	129	Kovanda in KČR 3
Anagallis monelli	L.	Prim	neo 3	cas	1953		M	1	Kovanda in KČR 3
Anaphalis margaritacea	(L.) Benth.	Aste	neo 2	nat	1887		AmN As	62	Kubát in KČR 7*
Anchusa azurea	Mill.	Bora	neo *	cas			M	1	Křísa in KČR 6
Anchusa officinalis	L.	Bora	ar EM	nat			E M	221	Křísa in KČR 6
Androsace elongata	L.	Prim	ar *	nat			E	73	Kaplan in Kaplan et al. 2023
Anethum graveolens	L.	Apia	ar EM	cas			M	173	Tomšovic in KČR 5
Angelica archangelica subsp. *archangelica*		Apia	ar/neo	nat			E As	6	Jehlík & Rostański 1975, Slavík in KČR 5*
Anoda cristata	(L.) Schltdl.	Malv	neo 3	cas	1973		AmN & C & S	1	Slavík in KČR 3
Anthemis arvensis	L.	Aste	ar BR	nat			M	578	Prančl in Kaplan et al. 2023
Anthemis ×bollei	Asch.	Aste	ar *	cas			hybrid	1	Dvořáková in KČR 7
Anthemis austriaca	Jacq.	Aste	ar EM	nat			M	194	Prančl in Kaplan et al. 2023
Anthemis cotula	L.	Aste	ar BR	nat			M	378	Prančl in Kaplan et al. 2023
Anthemis cretica	L.	Aste	neo 2	cas	1865		E	3	Čelakovský 1873, Prančl in Kaplan et al. 2023*
Anthemis ×ochroleuca	Čelak. f.	Aste	ar *	cas			hybrid	6	Čelakovský 1888c, this study*
Anthoxanthum aristatum	Boiss.	Poac	neo 2	cas	1877		M	1	Dostál 1989, Kaplan et al. 2019a
Anthriscus caucalis	M. Bieb.	Apia	ar EM	nat			E M	108	Dřevojan & Prančl in Kaplan et al. 2018a*
Anthriscus cerefolium var. *cerefolium*	(L.) Hoffm.	Apia	ar/neo	nat			anec	69	Dřevojan & Prančl in Kaplan et al. 2018a*
Anthriscus cerefolium var. *trichocarpus*	Neilr.	Apia	ar/neo	nat			M	72	Dřevojan & Prančl in Kaplan et al. 2018a
Antirrhinum majus	L.	Plan	ar/neo	nat	1819		M	67	Grulich in KČR 6
Apera spica-venti	(L.) P. Beauv.	Poac	ar BR	nat			E M	564	Kaplan et al. 2019a
Apium graveolens	L.	Apia	ar EM	cas			anec	13	Tomšovic in KČR 5
Aquilegia atrata	W. D. J. Koch	Ranu	neo 3	cas			E	6	Chrtková in KČR 1
Aquilegia flabellata	Siebold et Zucc.	Ranu	neo 4	cas	2013		As	1	Chytrá & Chytrý in Hadinec & Lustyk 2014, this study*
Arabis alpina	L.	Bras	neo 2	nat			E Af	10	Štěpánek in KČR 3
Arabis caucasica	Willd.	Bras	neo 3	nat	1957		E	13	Štěpánek in KČR 3
Arabis procurrens	Waldst. et Kit.	Bras	neo 2	nat			E	2	Štěpánek in KČR 3
Aralia cordata	Thunb.	Aral	neo 4	cas	2020		As	1	Lustyk in Lustyk & Doležal 2022, this study*

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Arctium ×ambiguum	(Čelak.) Nyman	Aste	ar *	cas			hybrid	192	Štěpánek in KČR 7
Arctium ×cimbricum	(E. H. L. Krause) Hayek	Aste	ar *	cas			hybrid	4	Štěpánek in KČR 7
Arctium lappa	L.	Aste	ar NE	nat			E	563	Koutecký in Kaplan et al. 2019b
Arctium ×mixtum	(Simonk.) Nyman	Aste	ar *	cas			hybrid	109	Štěpánek in KČR 7
Arctium ×neumannii	P. Fourn.	Aste	ar *	cas			hybrid	5	Štěpánek in KČR 7
Arctium ×nothum	(Ruhmer) J. Weiss	Aste	ar *	cas			hybrid	110	Štěpánek in KČR 7
Arctium tomentosum	Mill.	Aste	ar NE	nat			E	606	Koutecký in Kaplan et al. 2019b
Arctotheca calendula	(L.) Levyns	Aste	neo 3	cas	1961	1965	Af	3	Dvořák & Kühn 1966
Argemone mexicana	L.	Papa	neo 3	cas	1965		AmC	1	Kubát in KČR 1
Aristolochia macrophylla	Lam.	Aris	neo 4	cas	2005		AmN	14	this study, Šumberová in Kaplan et al. 2023*
Armeria maritima	(Mill.) Willd.	Plum	neo 2	cas	1890		E	13	Domin 1919
Armoracia rusticana	G. Gaertn. et al.	Bras	ar LM	nat			E	575	Tomšovic in KČR 3
Arrhenatherum elatius	(L.) J. Presl et C. Presl	Poac	ar EM	inv			E	662	Kaplan et al. 2019a
Artemisia abrotanum	L.	Aste	ar/neo	cas			anec	10	Grulich in KČR 7
Artemisia absinthium	L.	Aste	ar *	nat			M	341	Grulich in KČR 7
Artemisia alba	Turra	Aste	neo 3	cas	1965		M	3	Grulich in KČR 7, Hadinec & Lustyk 2012
Artemisia alpina	Willd.	Aste	neo 4	cas	2008		E M	1	Čáp in Hadinec & Lustyk 2011
Artemisia annua	L.	Aste	neo 2	cas	1874		M As	19	Hejný et al. 1973, Jehlík 1998, Grulich in KČR 7*
Artemisia biennis	Willd.	Aste	neo 3	cas	1960	1983	AmN	1	Jehlík 1984, Grulich in KČR 7
Artemisia dracunculus	L.	Aste	ar/neo	cas			E As	12	Grulich in KČR 7
Artemisia ludoviciana subsp. *ludoviciana*	Nutt.	Aste	neo 3	cas	1971		AmN	1	Grüll 1974, Grulich in KČR 7
Artemisia repens	Willd.	Aste	neo 2	cas	1872		E M As	6	Grulich in KČR 7
Artemisia scoparia	Waldst. et Kit.	Aste	ar *	nat			E M As	136	Grulich in KČR 7
Artemisia siversiana	Willd.	Aste	neo 3	cas	1953		E As	9	Hejný 1964, Hejný et al. 1973, Grulich in KČR 7
Artemisia tournefortiana	Rchb.	Aste	neo 3	nat	1964		M As	13	Grüll 1972, Grulich in KČR 7
Artemisia verlotiorum	Lamotte	Aste	neo 2	nat	1947		As	9	Gutte & Pyšek 1972, Jehlík 1998, Grulich in KČR 7
Asclepias syriaca	L.	Apoc	neo 2	inv			AmN	73	Koschatzky 1821, Štěpánková in Kaplan et al. 2017a
Asparagus officinalis subsp. *officinalis*	L.	Aspa	ar/neo	nat			As	222	Bělohlávková & Slavíková in KČR 8
Asparagus verticillatus	L.	Aspa	neo 4	cas	2009		E M As	3	Danihelka et al. 2020b, this study*
Asperugo procumbens	L.	Bora	ar *	nat			M	102	Křísa in KČR 6
Asperula arvensis	L.	Rubi	ar BR	cas			M	51	Kubát in KČR 6
Asperula orientalis	Boiss. et Hohen.	Rubi	neo 2	cas	1905		M	4	Kubát in KČR 6
Astilbe Arendsii Group		Saxi	neo 3	cas	1999		anec	2	Pyšek et al. 2002
Astragalus alopecurus	Pall.	Faba	neo 2	cas	1872		E As	1	Čelakovský 1875, Kaplan & Danihelka in Kaplan et al. 2016b*
Astragalus sulcatus	L.	Faba	neo 4	cas	2016		E As	1	Danihelka & Sedláček 2017, this study*
Astrodaucus orientalis	(L.) Drude	Apia	neo 2	cas	1847		E M	1	Tomšovic in KČR 5
Atocion armeria	(L.) Raf.	Cary	neo 2	cas	1850		E M	36	Šourková in KČR 2, Grulich in Hadinec & Lustyk 2006
Atriplex hortensis	L.	Amara	ar LM	cas			E	158	Kirschner & Tomšovic in KČR 2
Atriplex littoralis	L.	Amara	neo 3	cas	1977		E M AmN	2	Kirschner & Tomšovic in KČR 2
Atriplex micrantha	Ledeb.	Amara	neo 4	inv	1967		E As	51	Kocián in Hadinec & Lustyk 2016*
Atriplex ×northusiana	K. Wein	Amara	ar *	cas			hybrid	1	Kirschner & Tomšovic in KČR 2
Atriplex oblongifolia	Waldst. et Kit.	Amara	ar BR	nat			E M As	198	Kirschner & Tomšovic in KČR 2
Atriplex patula	L.	Amara	ar NE	nat			E M As	590	Kirschner & Tomšovic in KČR 2
Atriplex rosea	L.	Amara	ar *	cas			E M	170	Prach in Hadinec & Lustyk 2013
Atriplex sagittata	Borkh.	Amara	ar NE	inv			E M As	442	Kirschner & Tomšovic in KČR 2
Atriplex semilunaris	Aellen	Amara	neo 2	cas	1963		Au	1	Kirschner & Tomšovic in KČR 2
Atriplex sibirica	L.	Amara	neo 2	cas	1939		As	1	Kirschner & Tomšovic in KČR 2
Aubrieta deltoidea	(L.) DC.	Bras	neo 2	cas			M	9	Dvořák in KČR 3
Avena barbata	Link	Poac	neo 3	cas	1962	1963	M	1	Dvořák & Kühn 1966
Avena fatua	L.	Poac	ar BR	nat			M	548	Zázvorka in Kaplan et al. 2015
Avena sativa Chinensis Group		Poac	neo *	cas			anec	1	Kaplan et al. 2019a
Avena sativa Praegravis Group		Poac	neo 4	cas			anec	1	Kaplan et al. 2019a
Avena sativa Sativa Group		Poac	ar RMP	cas			anec	3	Kaplan et al. 2019a
Avena sterilis subsp. *ludoviciana*	(Durieu) Gillet et Magne	Poac	neo 3	cas	1965	1968	M	2	Zázvorka in Kaplan et al. 2015
Avena sterilis subsp. *sterilis*	L.	Poac	neo 2	cas	1895	1923	M	2	Domin 1917, Pyšek et al. 2012b, Zázvorka in Kaplan et al. 2015
Avena strigosa	Schreb.	Poac	ar *	cas		1946	E	71	Kropáč 1981, Zázvorka in Kaplan et al. 2015*

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Avena vilis	Wallr.	Poac	ar *	cas			hybrid	1	Pyšek et al. 2012b
Axyris amaranthoides	L.	Amara	neo 3	cas	1953		As	1	Tomšovic in KČR 2
Azolla filiculoides	Lam.	Salv	neo 2	nat	1895		AmN	16	Kaplan in Kaplan et al. 2017a
Ballota nigra subsp. *meridionalis*	(Bég.) Bég.	Lami	neo 2	cas	1932		E M	1	Štěpánková in KČR 6
Ballota nigra subsp. *nigra*	L.	Lami	ar EM	nat			E M	125	Štěpánková in KČR 6
Basella alba	L.	Base	neo 2	cas	1901	1901	As	1	Domin 1917, Tomšovic in KČR 2
Bassia scoparia subsp. *densiflora*	(Moq.) Cirujano et Velayos	Amara	neo 2	inv	1901		E M As	18	Tomšovic in KČR 2, Jehlík 1998
Bassia scoparia subsp. *scoparia*	(L.) Voss	Amara	neo 2	inv	1819		E M As	78	Tomšovic in KČR 2, Jehlík 1998
Bassia scoparia subsp. *scoparia* 'Trichophylla'		Amara	neo 2	cas	1819		anec	78	Tomšovic in KČR 2
Beckmannia eruciformis subsp. *eruciformis*	(L.) Host	Poac	neo 3	cas			E As	3	Vicherek et al. 2000, Kaplan et al. 2019a
Beckmannia syzigachne	(Steud.) Fernald	Poac	neo 3	cas	1994		AmN As	3	Jelínková in Hadinec & Lustyk 2011, Řepka & Paukertová in Lustyk & Doležal 2019
Bellidiastrum michelii	Cass.	Aste	neo *	cas			E	1	Bělohlávková in KČR 7
Berberis julianae	C. K. Schneid.	Berb	neo 4	cas	2010		As	11	Pyšek et al. 2012b
Berberis thunbergii	DC.	Berb	neo 4	cas	2011		As	43	Pyšek et al. 2012b
Bergenia crassifolia	(L.) Fritsch	Saxi	neo 2	cas			As	41	Hrouda & Šourková in KČR 3
Berteroa incana subsp. *incana*	(L.) DC.	Bras	ar EM	nat			E M As	140	Smejkal in KČR 3
Berteroa incana subsp. *stricta*	(Boiss. et Heldr.) Stoj. et Stef.	Bras	neo 3	cas	1955		M	1	Smejkal 1994, Šumberová in Kaplan et al. 2023
Beta trigyna	Waldst. et Kit.	Amara	neo 2	cas	1935		E M	1	Tomšovic in KČR 2
Beta vulgaris weed forms of hybrid origin		Amara	neo 3	inv			hybrid		this study*
Beta vulgaris Altissima Group		Amara	neo 2	cas			anec	1	Skalický & Pulkrábek 2006, Landová et al. 2010*
Beta vulgaris Cicla Group		Amara	ar/neo	cas			anec	2	Pyšek et al. 2002
Beta vulgaris Vulgaris Group		Amara	ar LM	cas			anec	2	Pyšek et al. 2002
Bidens connata	Willd.	Aste	neo 2	nat	1934		AmN	29	Štěpánková in Kaplan et al. 2016b*
Bidens ferulifolia	(Jacq.) Sweet	Aste	neo 4	cas	2002		AmN	7	Pyšek et al. 2012b, Lustyk & Doležal 2021
Bidens frondosa	L.	Aste	neo 2	inv	1907		AmN	550	Štěpánková in Kaplan et al. 2016b
Bidens pilosa	L.	Aste	neo 2	cas	1913	1981	AmN & C & S	3	Štěpánková in Kaplan et al. 2016b
Bifora radians	M. Bieb.	Apia	ar/neo	cas			M	48	Křísa in KČR 5*
Bistorta amplexicaulis	(D. Don) Greene	Polgn	neo 2	cas	1966		As	1	Chrtek in KČR 2
Blumenbachia hieronymi	Urb.	Loas	neo 2	cas	1912	1918	AmS	1	Domin 1918, this study*
Bolboschoenus glaucus	(Lam.) S. G. Sm.	Cype	neo 2	nat	1925		E M Af	1	Hroudová et al. 1999, Hroudová & Ducháček in Kaplan et al. 2015
Borago officinalis	L.	Bora	ar/neo	cas			M	44	Křísa in KČR 6
Bowlesia incana	Ruiz. et Pav.	Apia	neo 2	cas	1918	1918	AmN & C & S	1	Domin 1918, this study*
Brachypodium rupestre	(Host) Roem. et Schult.	Poac	neo 4	nat	2005		E M	6	Dančák & Hadinec in Hadinec & Lustyk 2012
Brassica elongata subsp. *elongata*	Ehrh.	Bras	neo 2	cas	1873		E	6	Zelený in KČR 3
Brassica elongata subsp. *integrifolia*	(Boiss.) Breistr.	Bras	neo 3	cas	1960		E As	1	Zelený in KČR 3
Brassica juncea	(L.) Czern.	Bras	neo 3	cas	1963		As	8	Zelený in KČR 3
Brassica napus	L.	Bras	ar/neo	cas			anec	398	Pyšek et al. 2012b*
Brassica nigra	(L.) W. D. J. Koch	Bras	ar EM	cas			M	21	Zelený in KČR 3*
Brassica oleracea	L.	Bras	ar EM	cas			M	103	Zelený in KČR 3
Brassica rapa var. *rapa*	L.	Bras	ar IR	cas			M	6	Zelený in KČR 3
Brassica rapa var. *sylvestris*	(Lam.) Briggs	Bras	neo 3	cas	1964		M	1	Kühn 1968, Zelený in KČR 3
Briza maxima	L.	Poac	neo *	cas			M	1	Kaplan et al. 2019a
Bromus arvensis	L.	Poac	ar NE	cas			M	174	Chrtek & Danihelka in Kaplan et al. 2022
Bromus briziformis	Fisch. et C. A. Mey.	Poac	neo 2	cas	1895	1959	M	8	Chrtek & Danihelka in Kaplan et al. 2022
Bromus bromoideus	(Lej.) Crép.	Poac	neo 2	cas	1889	1889	E	1	Danihelka in Hadinec & Lustyk 2014, Chrtek & Danihelka in Kaplan et al. 2022, this study*
Bromus carinatus	Hook. et Arn.	Poac	neo 2	nat	1934		AmN	130	Chrtek & Danihelka in Kaplan et al. 2022
Bromus catharticus	Vahl	Poac	neo 2	cas	1853		AmS	12	Chrtek & Danihelka in Kaplan et al. 2022
Bromus commutatus	Schrad.	Poac	ar *	nat			M	196	Chrtek & Danihelka in Kaplan et al. 2022
Bromus diandrus	Roth	Poac	neo 2	cas	1929	1977	M	8	Chrtek & Danihelka in Kaplan et al. 2022*
Bromus hordeaceus subsp. *hordeaceus*	L.	Poac	ar LM	nat			M	600	Chrtek & Danihelka in Kaplan et al. 2022
Bromus japonicus	Thunb.	Poac	ar *	nat			M	226	Chrtek & Danihelka in Kaplan et al. 2022

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Bromus lanceolatus	Roth	Poac	neo 2	cas	1848		M	12	Chrtek & Danihelka in Kaplan et al. 2022
Bromus lepidus	Holmb.	Poac	neo 2	cas	1883	1976	E	11	Chrtek & Danihelka in Kaplan et al. 2022
Bromus madritensis	L.	Poac	neo 2	cas	1926	1961	M	7	Chrtek & Danihelka in Kaplan et al. 2022
Bromus rubens	L.	Poac	neo 3	cas	1958	1961	M	3	Dvořák & Kühn 1966, Chrtek & Danihelka in Kaplan et al. 2022
Bromus scoparius	L.	Poac	neo 2	cas	1927	1961	M As	3	Dvořák & Kühn 1966, Chrtek & Danihelka in Kaplan et al. 2022
Bromus secalinus	L.	Poac	ar NE	nat			M	337	Chrtek & Danihelka in Kaplan et al. 2022*
Bromus sterilis	L.	Poac	ar NE	inv			M	450	Chrtek & Danihelka in Kaplan et al. 2022*
Bromus tectorum	L.	Poac	ar BR	nat			M	476	Chrtek & Danihelka in Kaplan et al. 2022
Broussonetia papyrifera	(L.) Vent.	Mora	neo 4	cas	2002		As	1	Rydlo in Rydlo 2003, this study*
Brunnera macrophylla	(Adam) I. M. Johnst.	Bora	neo 3	cas	1965		E M	21	Holub 1970, Křísa in KČR 6, Kaplan in Hadinec & Lustyk 2009
Bryonia alba	L.	Cucu	ar BR	nat			M	314	Chrtková in KČR 2
Bryonia dioica	Jacq.	Cucu	ar *	nat			E M	41	Chrtková in KČR 2
Buddleja alternifolia	Maxim.	Scro	neo 4	cas	2008		As	3	Pyšek et al. 2012b
Buddleja davidii	Franch.	Scro	neo 4	nat	2000		As	14	Pyšek et al. 2002
Buglossoides arvensis subsp. *arvensis*	(L.) I. M. Johnst.	Bora	ar BR	nat			M	173	Danihelka in Kaplan et al. 2020
Buglossoides incrassata subsp. *incrassata*	(Guss.) I. M. Johnst.	Bora	neo 4	cas	2005		E M	1	Danihelka in Hadinec & Lustyk 2014, Danihelka in Kaplan et al. 2020
Buglossoides incrassata subsp. *splitgerberi*	(Guss.) E. Zippel et Selvi	Bora	ar *	nat			E M	235	Danihelka in Hadinec & Lustyk 2014, Danihelka in Kaplan et al. 2020
Bunias erucago	L.	Bras	neo 2	cas	1896		M	2	Smejkal in KČR 3
Bunias orientalis	L.	Bras	neo 2	inv	1856		E	236	Jehlík & Slavík 1968, Hejný et al. 1973, Smejkal in KČR 3, Jehlík 1998, Křivánek 2004
Bunium bulbocastanum	L.	Apia	neo 2	cas	1879		E As	1	Tomšovic in KČR 5
Bupleurum croceum	Fenzl	Apia	neo 2	cas	1943	1943	M	1	Snogerup & Snogerup 2001, Hadinec in Hadinec et al. 2002
Bupleurum pachnospermum	Pančić	Apia	neo 2	cas	1885	1885	E	1	Snogerup & Snogerup 2001
Bupleurum rotundifolium	L.	Apia	ar BR	nat			M	135	Šourková & Hrouda in KČR 5, Štefánek in Hadinec et al. 2005*
Buxus sempervirens	L.	Buxa	ar/neo	cas	2010		E M	64	Pyšek et al. 2012b
Cakile maritima subsp. *baltica*	(Rouy et Fouc.) P. W. Ball	Bras	neo 2	cas	1929		E	1	Kilián & Krkavec 1961, Dvořák in KČR 3
Cakile maritima subsp. *euxina*	(Pobed.) Nyár.	Bras	neo 3	cas	1960	1994	E	1	Kilián & Krkavec 1961, Dvořák in KČR 3
Calandrinia compressa	DC.	Port	neo 2	cas	1853		AmS	1	Sekera 1854, Skalický & Sutorý in KČR 2
Calendula arvensis	L.	Aste	neo 2	cas	1901		M	10	Slavíková in KČR 7
Calendula officinalis	L.	Aste	ar/neo	cas	1872		anec	209	Slavíková in KČR 7
Callistephus chinensis	(L.) Nees	Aste	neo 2	cas	1872		As	19	Bělohlávková in KČR 7
Calystegia hederacea	Wall.	Conv	neo 3	cas	1985		As	1	Trávníček & Dančák 2011
Calystegia pulchra	Brummit et Heywood	Conv	neo 2	nat	1857		As	171	Holub 1971, Křísa in KČR 6
Camelina alyssum subsp. *alyssum*	(Mill.) Thell.	Bras	ar EM	cas			anec	3	Smejkal in KČR 3
Camelina alyssum subsp. *integerrima*	(Čelak.) Smejkal	Bras	ar *	cas			E M As	1	Smejkal in KČR 3
Camelina laxa	C. A. Mey.	Bras	neo 3	cas	1958		M	1	Chrtek & Žertová 1958, Smejkal in KČR 3
Camelina microcarpa subsp. *microcarpa*	DC.	Bras	ar BR	nat			E As	10	Smejkal in KČR 3
Camelina microcarpa subsp. *pilosa*	(DC.) Hiitonen	Bras	ar *	nat			E M As	29	Smejkal in KČR 3
Camelina rumelica	Velen.	Bras	neo 3	cas	1963		M	1	Smejkal in KČR 3
Camelina sativa var. *sativa*	(L.) Crantz	Bras	ar BR	cas			anec	1	Smejkal in KČR 3
Camelina sativa var. *zingeri*	Mirek	Bras	neo 2	cas			M	5	Smejkal in KČR 3
Campanula alliariifolia	Willd.	Camp	neo 3	cas			E	2	Kovanda in KČR 6
Campanula ×iserana	Kovanda	Camp	neo *	cas	1974		hybrid	1	Kovanda 1999, Kovanda in KČR 6
Campanula lactiflora	M. Bieb.	Camp	neo 3	cas	1973		M	1	Řehořek in Hadinec & Lustyk 2009
Campanula medium	L.	Camp	neo 2	cas	1968		M	3	Kovanda in KČR 6
Campanula rapunculus	L.	Camp	neo 2	cas	1892		E M	29	Kovanda in KČR 6
Campanula rhomboidalis	L.	Camp	neo 2	cas	1880		M	2	Kovanda & Husová 1976, Kovanda 1996, Kovanda in KČR 6*
Cannabis sativa var. *sativa*	L.	Cannab	ar IR	cas			E M	71	Chrtek in KČR 1
Cannabis sativa var. *spontanea*	Vavilov	Cannab	neo 2	inv	1868		E M As	25	Soják 1962, Chrtek in KČR 1, Jehlík 1998
Capsella bursa-pastoris	(L.) Medik.	Bras	ar NE	nat			M	639	Dvořáková in KČR 3
Capsella rubella	Reut.	Bras	neo 4	cas	2006		M	1	Jongepier in Hadinec & Lustyk 2007
Caragana arborescens	Lam.	Faba	neo 4	cas			As	103	Tichá 2004
Cardamine chelidonia	L.	Bras	neo 2	nat	1930		M	14	Kučera 1991, Hrouda in KČR 3, Paulič in Hadinec & Lustyk 2007, 2008
Cardamine hirsuta	L.	Bras	ar LM	inv			E M As Af	229	Marhold in KČR 3*

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Cardamine occulta	Hornem.	Bras	neo 4	nat			As	8	Ducháček et al. 2020, Marhold and Ducháček in Hadinec et al. 2021, this study*
Carduus acanthoides	L.	Aste	ar IR	nat			M	507	Štěpánková in Kaplan et al. 2017b
Carduus ×leptocephalus	Peterm.	Aste	ar *	cas			hybrid	7	Štěpánková in KČR 7
Carduus ×orthocephalus	Wallr.	Aste	ar *	cas			hybrid	7	Štěpánková in KČR 7
Carduus tenuiflorus	Curtis	Aste	neo 3	cas	1967	1967	E	1	Štěpánková in Kaplan et al. 2017b
Carex grayi	J. Carey	Cype	neo 4	cas	2004		AmN	7	Blažková 2007, Hrbáč in Hadinec & Lustyk 2012, Grulich & Řepka in Kaplan et al. 2022
Carex muskingumensis	Schwein.	Cype	neo 2	cas	1947		AmN	4	Jedlička 1949, Grulich & Řepka in Kaplan et al. 2017a
Carthamus lanatus	L.	Aste	neo 3	cas	1958	1973	M	1	Dvořák & Kühn 1966, Danihelka in Hadinec & Lustyk 2013
Carthamus tinctorius	L.	Aste	ar/neo	cas	1876		M	10	Zelený in KČR 7
Caryopteris ×clandonensis	C. H. Curtis	Lami	neo 4	cas	2019		hybrid	2	Danihelka et al. 2020a, this study*
Castanea sativa	Mill.	Faga	ar/neo	cas			E M	105	Pyšek et al. 2002
Catalpa bignonioides	Walter	Bign	neo 3	cas			AmN	27	Skalická in KČR 6
Catapodium rigidum	(L.) C. E. Hubb.	Poac	neo 3	cas	1960	1960	E M	1	Kilián & Krkavec 1962, Danihelka & Hlisnikovský 2021b
Caucalis platycarpos subsp. *muricata*	(Čelak.) Holub	Apia	ar *	cas			M	2	Hrouda in KČR 5
Caucalis platycarpos subsp. *platycarpos*	L.	Apia	ar EM	nat			M	59	Hrouda in KČR 5
Celastrus orbiculatus	Thunb.	Cela	neo 4	cas			As	6	Skalická in KČR 5, Červinka & Sádlo 2000
Celosia argentea Cristata Group		Amara	neo 2	cas	1902		anec	1	Domin 1917
Celtis occidentalis	L.	Cannab	neo 4	cas	1994		AmN	14	Danihelka & Šumberová 2004, Velebil in Kaplan et al. 2023
Cenchrus echinatus	L.	Poac	neo 2	cas	1908	1968	AmN	3	Štěpánková in Kaplan et al. 2016b
Centaurea ×varnensis	Velen.	Aste	neo *	cas	1955	1966	hybrid	5	Koutecký & Mráz in Kaplan et al. 2018b
Centaurea benedicta	(L.) L.	Aste	ar/neo	cas	1882		M	12	Koutecký in Kaplan et al. 2018b
Centaurea bruguiereana subsp. *belangeriana*	(DC.) Bornm.	Aste	neo 3	cas	1974	1974	As	1	Jehlík 2013, Koutecký 2015, Koutecký in Hadinec & Lustyk 2016, Koutecký in Kaplan et al. 2018b, this study*
Centaurea calcitrapa	L.	Aste	neo 2	cas	1861		M	14	Koutecký in Kaplan et al. 2018b
Centaurea carniolica	Host	Aste	neo 2	cas	1823	1914	E	3	Opiz 1823, Koutecký in Hadinec & Lustyk 2016, Koutecký in Kaplan et al. 2017a
Centaurea cyanus	L.	Aste	ar EM	nat			anec	564	Koutecký in Kaplan et al. 2018b
Centaurea diffusa	Lam.	Aste	neo 2	nat			M	14	Koutecký & Mráz in Kaplan et al. 2018b
Centaurea ×extranea	Beck	Aste	neo *	cas	1882		hybrid	51	Koutecký in Kaplan et al. 2017a
Centaurea ×gerstlaueri	Erdner	Aste	neo *	cas	1921		hybrid	22	Koutecký in Kaplan et al. 2017a
Centaurea jacea × *C. nigrescens* × *C. oxylepis*		Aste	neo *	cas			hybrid	1	Koutecký 2008, this study*
Centaurea jacea × *C. transalpina*		Aste	neo *	cas			hybrid	1	Koutecký in Hadinec & Lustyk 2016, this study*
Centaurea ×javorkae	Budai et J. Wagner	Aste	neo *	cas	1908		hybrid	10	Koutecký in Kaplan et al. 2017a
Centaurea macrocephala	Willd.	Aste	neo 3	cas	1954		E	10	Koutecký in Kaplan et al. 2018b
Centaurea melitensis	L.	Aste	neo 2	cas	1901	1962	M	4	Domin 1919, Koutecký in Kaplan et al. 2018b
Centaurea nigra agg.		Aste	neo 2	nat	1854		E	33	Koutecký in Kaplan et al. 2017a*
Centaurea nigrescens	Willd.	Aste	neo 2	cas	1861		M	57	Koutecký in Kaplan et al. 2017a
Centaurea solstitialis subsp. *solstitialis*	L.	Aste	neo 2	cas	1819		M	80	Presl & Presl 1819, Koutecký in Kaplan et al. 2018b
Centaurea stoebe subsp. *australis*	(A. Kern.) Greuter	Aste	neo 2	nat	1896		E As	78	Otisková et al. 2014, Koutecký & Mráz in Kaplan et al. 2018b, this study*
Centaurea transalpina	DC.	Aste	neo 2	cas	1901		E	5	Koutecký in Hadinec & Lustyk 2016, Koutecký in Kaplan et al. 2017a
Centaurea weldeniana	Rchb.	Aste	neo 2	cas	1946	1946	M	1	Koutecký in Hadinec & Lustyk 2016, Koutecký in Kaplan et al. 2017a, this study*
Centranthus ruber	(L.) DC.	Vale	neo 2	cas	1880		M	3	Holub & Kirschner in KČR 5
Cephalaria gigantea	(Ledeb.) Bobrov	Dips	neo 3	cas	1951		E	17	Smejkal 1952, Štěpánek & Holub in KČR 5
Cephalaria syriaca	(L.) Roem. et Schult.	Dips	neo 2	cas	1948		M	1	Štěpánek & Holub in KČR 5
Cephalaria transsylvanica	(L.) Roem. et Schult.	Dips	neo 4	cas	2016		E As	1	Doležal in Hadinec & Lustyk 2017, this study*
Cerastium ×maureri	M. Schulze	Cary	neo *	nat			hybrid	8	Pyšek et al. 2002
Cerastium subtetrandrum	(Lange) Murb.	Cary	neo 4	inv	2017		E	6	Danihelka et al. in Kaplan et al. 2020, this study*

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Cerastium tomentosum	L.	Cary	neo 2	nat			M	147	Smejkal in KČR 2
Chaenomeles japonica	(Thunb.) Spach	Rosa	neo 3	cas	1986		As	14	Pyšek et al. 2002
Chaenorhinum origanifolium	(L.) Kostel.	Plan	neo 4	cas	2005		E M	1	Kocián & Kocián 2013, this study*
Chaerophyllum nodosum	(L.) Crantz	Apia	neo 3	cas	1997		E M	1	Filippov 1999
Chamaecyparis lawsoniana	(Al. Murray bis) Parl.	Cupr	neo 3	cas			AmN	31	Pyšek et al. 2002
Chamaecytisus elongatus	(Waldst. et Kit.) Link	Faba	neo 3	nat			E	3	Skalická in KČR 4
Chenopodium acuminatum	Willd.	Amara	neo 3	cas	1953		As	1	Dostálek et al. in KČR 2
Chenopodium album subsp. *pedunculare*	(Bertol.) Arcang.	Amara	ar *	nat			E	250	Dostálek et al. in KČR 2
Chenopodium berlandieri subsp. *zschackei*	(Murr) Zobel	Amara	neo 3	cas			AmN	1	Dostálek et al. in KČR 2
Chenopodium bonus-henricus	L.	Amara	ar BR	nat			E	556	Šumberová & Dřevojan in Kaplan et al. 2020
Chenopodium capitatum	(L.) Asch.	Amara	neo 2	cas	1910		AmN	10	Šumberová & Dřevojan in Kaplan et al. 2020
Chenopodium foliosum	Asch.	Amara	ar IR	cas	1847		E M As	50	Šumberová & Dřevojan in Kaplan et al. 2020
Chenopodium giganteum	D. Don	Amara	neo 4	cas	2004		As	3	Mandák & Marek in Lustyk & Doležal 2020, this study*
Chenopodium hircinum	Schrad.	Amara	neo 3	cas	1957		AmS	7	Dostálek et al. in KČR 2
Chenopodium karoi	(Murr) Aellen	Amara	neo 3	cas			As	1	Dostálek et al. in KČR 2
Chenopodium missouriense	Aellen	Amara	neo 3	cas	1963		AmN	2	Hejný et al. 1973, Dostálek et al. in KČR 2
Chenopodium murale	L.	Amara	ar NE	nat			M	106	Dostálek et al. in KČR 2
Chenopodium nitrariaceum	(F. Muell.) Benth.	Amara	neo 3	cas	1963		Au	1	Dostálek et al. in KČR 2
Chenopodium probstii	Aellen	Amara	neo 2	cas	1916		AmN	8	Dostálek et al. in KČR 2
Chenopodium quinoa	Willd.	Amara	neo 3	cas	1966		AmS	1	Dostálek et al. in KČR 2
Chenopodium striatiforme	Murr	Amara	neo 3	nat			E M	39	Dostálek et al. in KČR 2
Chenopodium strictum	Roth	Amara	neo 3	nat			M	303	Dostálek 1983, Dostálek et al. in KČR 2
Chenopodium urbicum	L.	Amara	ar NE	nat			E M As	71	Dostálek et al. in KČR 2
Chenopodium vulvaria	L.	Amara	ar EM	nat			E M As	162	Dostálek 1983, Dostálek et al. in KČR 2
Chloris divaricata	R. Br.	Poac	neo 3	cas	1959	1960	Au	1	Kaplan in Hadinec & Lustyk 2014, this study*
Chloris pectinata	Benth.	Poac	neo 3	cas	1959	1959	Au	1	Kaplan in Hadinec & Lustyk 2014, this study*
Chloris truncata	R. Br.	Poac	neo 3	cas	1959	1964	As Au	3	Dvořák & Kühn 1966, Kaplan in Hadinec & Lustyk 2014
Chloris virgata	Sw.	Poac	neo 3	cas	1959	1959	AmC AmS	1	Dvořák & Kühn 1966, Kaplan in Hadinec & Lustyk 2014*
Chorispora tenella	(Pall.) DC.	Bras	neo 3	cas	1960		E As	4	Tomšovic in KČR 3
Chrysanthemum ×morifolium	Hemsl.	Aste	neo 4	cas			anec	1	Pyšek et al. 2002, Zelený in KČR 7
Cicer arietinum	L.	Faba	neo *	cas			M	1	Chrtková in KČR 4
Cicerbita macrophylla subsp. *uralensis*	(Rouy) P. D. Sell	Aste	neo 2	nat			E	26	Kovanda in KČR 7
Cichorium endivia	L.	Aste	neo 2	cas	1968		M	6	Dvořáková in KČR 7, Grulich in Hadinec & Lustyk 2011
Cichorium intybus	L.	Aste	ar EM	nat			M	528	Dvořáková in KČR 7
Cirsium arvense	(L.) Scop.	Aste	ar NE	inv			E As	660	Bureš in KČR 7
Cirsium ×aschersonii	Čelak.	Aste	neo *	cas			hybrid	1	Bureš in KČR 7
Cirsium ×celakovskyanum	Knaf	Aste	ar *	cas			hybrid	4	Bureš in KČR 7
Cirsium echinus	(M. Bieb.) Hand.-Mazz.	Aste	neo 2	cas	1937		M	1	Bureš in KČR 7
Cirsium ×moravicum	Petr.	Aste	ar *	cas			hybrid	1	Bureš in KČR 7
Cirsium ×polivkae	Podp.	Aste	ar *	cas			hybrid	1	Bureš in KČR 7
Cirsium ×sessile	Peterm.	Aste	ar *	cas			hybrid	7	Bureš in KČR 7
Cirsium ×sextenum	Huter	Aste	ar *	cas			hybrid	1	Bureš in KČR 7
Citrullus lanatus	(Thunb.) Matsum. et Nakai	Cucu	ar LM	cas			As Af	14	Chrtková in KČR 2
Clarkia amoena	(Lehm.) A. Nelson et J. F. Macbr.	Onag	neo 4	cas	2007		AmN	1	Lepší in Lustyk & Doležal 2021, this study*
Clarkia pulchella	Pursh	Onag	neo 3	cas			AmN	1	Smejkal in KČR 5
Clarkia unguiculata	Lindl.	Onag	neo 2	cas	1914	?1986	AmN	1	Domin 1918
Claytonia perfoliata	Willd.	Mont	neo 3	cas	1975		AmN AmC	11	Husák 1977, Uher & Lustyk in Lustyk & Doležal 2019
Claytonia sibirica	L.	Mont	neo 3	nat	1951		AmN	4	Holub 1975, Skalický & Sutorý in KČR 2, Paulič in Hadinec & Lustyk 2007
Clematis flammula	L.	Ranu	neo *	cas			M	1	Křísa in KČR 1
Clematis tangutica	(Maxim.) Korsh.	Ranu	neo 3	cas	1953		As	4	Pilát 1953, Procházka 1998, Hrouda in Kubát et al. 2002

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Clematis viticella	L.	Ranu	neo 3	cas			M	9	Křísa in KČR 1
Cleome hassleriana	Chodat	Cleo	neo 4	cas	2012		AmS	3	Uher in Hadinec & Lustyk 2016, this study*
Clinopodium grandiflorum	(L.) Kuntze	Lami	neo 2	cas	1945		E M	1	Štěpánková in KČR 6
Clinopodium menthifolium	(Host) Stace	Lami	neo 3	cas	1989		E M	1	Štěpánková in KČR 6
Clinopodium nepeta subsp. *glandulosum*	(Req.) Govaerts	Lami	neo 2	cas	1948		E M	1	Štěpánková in KČR 6
Clinopodium nepeta subsp. *nepeta*	(L.) Kuntze	Lami	neo 3	cas	1996		E M	1	Štěpánková in KČR 6
Cnidium silaifolium	(Jacq.) Simonk.	Apia	neo 2	cas	1868	1956	E M	3	Pranči in Kaplan et al. 2023
Cochlearia danica	L.	Bras	neo 4	inv	2016		E	36	Ducháček et al. 2017, Ducháček et al. in Kaplan et al. 2018a, this study*
Cochlearia officinalis	L.	Bras	ar/neo	cas	1819	1928	E	1	Ducháček in Kaplan et al. 2018a
Collomia grandiflora	Lindl.	Pole	neo 2	nat	1880		AmN	5	Křísa in KČR 6
Colutea arborescens	L.	Faba	neo 2	nat	1819		E M	62	Chrtková in KČR 4
Commelina communis	L.	Comm	neo 2	cas	1940		As	84	Hejný et al. 1973, Jehlík 1998, Kaplan et al. 2019a
Conium maculatum	L.	Apia	ar EM	nat			M As	321	Křísa in KČR 5*
Conringia orientalis	(L.) C. Presl	Bras	ar *	nat			M	155	Smejkal in KČR 3
Consolida ajacis	(L.) Schur	Ranu	neo 2	cas	1880		M	28	Chrtková in KČR 1
Consolida hispanica	(Costa) Greuter et Burdet	Ranu	neo 2	nat	1913		E M As	68	Chrtková in KČR 1, Jehlík 1998
Consolida regalis subsp. *regalis*	Gray	Ranu	ar BR	nat			M	345	Chrtková in KČR 1
Convallaria majalis var. *transcaucasica*	(Grossh.) Knorring	Aspa	neo 4	cas			E	1	Čížek & Král 2009, Zázvorka in Kaplan et al. 2016b
Convolvulus arvensis	L.	Conv	ar NE	nat			M	587	Křísa in KČR 6
Convolvulus tricolor	L.	Conv	neo 1	cas			M	2	Křísa in KČR 6
Conyza bonariensis	(L.) Cronquist	Aste	neo 3	cas	1964		AmS	2	Šída 2003, Sádlo in Lustyk & Doležal 2022
Conyza canadensis	(L.) Cronquist	Aste	neo 1	inv	1750		AmN	580	Šída in KČR 7
Conyza sumatrensis	(Retz.) E. Walker	Aste	neo 4	cas	2020		AmC AmS	2	Sádlo in Lustyk & Doležal 2021, this study*
Conyza triloba	Decne.	Aste	neo 3	cas	1971	1971	As Af	1	Šída 2003
Coreopsis lanceolata	L.	Aste	neo 3	cas	1962		AmN	1	Bělohlávková in KČR 7
Coreopsis tinctoria	Nutt.	Aste	neo 2	cas	1883		AmN	4	Uher in Lustyk & Doležal 2021
Coriandrum sativum	L.	Apia	ar LM	cas			M	24	Tomšovic in KČR 5
Corispermum gmelinii	Bunge	Amar	neo 3	cas	1960	1960	As	1	Danihelka in Hadinec & Lustyk 2013, Danihelka in Kaplan et al. 2018b*
Corispermum pallasii	Steven	Amara	neo 2	nat	1933		E	28	Jongepier in Hadinec & Lustyk 2017, Danihelka in Kaplan et al. 2018b
Cornus alba	L.	Corn	neo 3	nat			As	139	this study*
Cornus sericea	L.	Corn	neo 2	nat	1900		AmN	63	Holub in KČR 5
Coronilla scorpioides	(L.) W. D. J. Koch	Faba	neo 2	cas			M	1	Chrtková in KČR 4
Corydalis cheilanthifolia	Hemsl.	Papa	neo 4	cas	2012		As	3	Uher 2016, Pranči in Kaplan et al. 2022, this study*
Corylus colurna	L.	Betu	neo 3	cas	2001		M	53	Pyšek et al. 2002, Doležal in Lustyk & Doležal 2020
Corylus maxima	Mill.	Betu	neo 2	cas	1902		M	9	Kovanda in KČR 2
Cosmos bipinnatus	Cav.	Aste	neo 2	cas			AmN	35	Slavíková in KČR 7
Cotinus coggygria	Scop.	Anac	neo 2	cas	1884		E M	25	Skalická in KČR 5
Cotoneaster acutifolius	Turcz.	Rosa	neo 3	cas	1954		As	5	Danihelka in Hadinec & Lustyk 2012
Cotoneaster bullatus	Bois	Rosa	neo 4	cas	2001		As	3	Pyšek et al. 2002
Cotoneaster dielsianus	Diels	Rosa	neo 3	cas	2011		As	2	Pyšek et al. 2012b
Cotoneaster divaricatus	Rehder et E. H. Wilson	Rosa	neo 3	nat	1972		As	35	Pyšek et al. 2012b, Chytrý in Lustyk & Doležal 2018, Sedlák & Řepka in Lustyk & Doležal 2022*
Cotoneaster hjelmqvistii	Flinck et B. Hylmö	Rosa	neo 4	cas	2016		As	1	this study*
Cotoneaster horizontalis	Decne.	Rosa	neo 3	cas	1986		As	54	Pyšek et al. 2002, Joza 2009
Cotoneaster multiflorus	Bunge	Rosa	neo 4	cas	2013		As	1	Sedlák & Řepka in Lustyk & Doležal 2022, this study*
Cotoneaster splendens	Flinck et B. Hylmö	Rosa	neo 4	cas			As	1	Řepka in Lustyk & Doležal 2022, this study*
Cotoneaster zabelii	C. K. Schneid.	Rosa	neo 4	cas	2005		As	10	Čáp in Hadinec & Lustyk 2007
Cotula australis	(Spreng.) Hook. f.	Aste	neo 3	cas	1958	1961	Au	1	Dvořák & Kühn 1966, Bělohlávková in KČR 7
Cotula coronopifolia	L.	Aste	neo 4	cas	2010		Af	1	Kúr in Hadinec & Lustyk 2014, this study*
Crambe abyssinica	R. E. Fr.	Bras	neo 3	cas	1965		As Af	1	Smejkal 1989a, Smejkal in KČR 3
Crambe maritima	L.	Bras	neo 3	nat			E	3	Smejkal in KČR 3
Crataegus coccinea	L.	Rosa	neo 2	cas			AmN	12	Holub in KČR 3
Crataegus crus-galli	L.	Rosa	neo 2	cas	1900		AmN	2	Holub in KČR 3

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Crataegus flabellata	(Spach) K. Koch	Rosa	neo 3	cas	1993		AmN	1	Pyšek et al. 2002
Crataegus mollis	(Torr. et A. Gray) Scheele	Rosa	neo 3	cas			AmN	1	Holub in KČR 3
Crataegus persimilis	Sarg.	Rosa	neo 3	cas			AmN	2	Pyšek et al. 2002
Crepis capillaris	(L.) Wallr.	Aste	ar EM	nat			E	471	Kaplan in Kaplan et al. 2018b
Crepis foetida subsp. *foetida*	L.	Aste	neo 2	cas	1846		E M	8	Kaplan in Kaplan et al. 2018b
Crepis foetida subsp. *rhoeadifolia*	(M. Bieb.) Čelak.	Aste	ar *	nat			E M	149	Kaplan in Kaplan et al. 2018b
Crepis nicaeensis	Balb.	Aste	neo 2	cas	1880	1884	M	5	Kaplan in Kaplan et al. 2018b
Crepis pulchra	L.	Aste	neo 4	cas	2021		E M As	1	Hubatka & Lustyk in Lustyk & Doležal 2022, this study*
Crepis setosa	Haller f.	Aste	ar LM	nat			E	55	Kaplan & Dřevojan in Kaplan et al. 2018b
Crepis tectorum subsp. *tectorum*	L.	Aste	ar *	nat			M	256	Kaplan in Kaplan et al. 2018b
Crepis vesicaria subsp. *taraxacifolia*	(Thuill.) Thell.	Aste	neo 2	cas	1899	1900	M	1	Kaplan in Kaplan et al. 2018b
Crocosmia ×crocosmiiflora	(Lemoine) N. E. Br.	Irid	neo 4	cas			anec	2	Chrtek in KČR 8
Crocus chrysanthus	(Herb.) Herb.	Irid	neo 2	cas	1925		M	1	Šuk 2001, Chrtek in KČR 8
Crocus flavus	Weston	Irid	neo 3	cas			anec	1	Pyšek et al. 2002, Chrtek in KČR 8
Crocus sativus	L.	Irid	ar/neo	cas			anec	1	Chrtek in KČR 8
Crocus tommasinianus	Herb.	Irid	neo *	cas			E	1	Chrtek in KČR 8
Cucumis melo	L.	Cucu	ar LM	cas			As Af	2	Chrtková in KČR 2
Cucumis sativus	L.	Cucu	ar EM	cas			As	20	Chrtková in KČR 2
Cucurbita maxima	Duchesne	Cucu	neo 1	cas			AmS	3	Chrtková in KČR 2
Cucurbita pepo	L.	Cucu	neo 1	cas	1969		AmN & C & S	38	Chrtková in KČR 2
Cuscuta campestris	Yunck.	Conv	neo 2	inv	1883		AmN	72	Jehlík 1998, Chrtek in KČR 6
Cuscuta epilinum	Weihe	Conv	ar *	cas			anec	23	Chrtek in KČR 6
Cyclospermum leptophyllum	(Pers.) Britton et P. Wilson	Apia	neo 4	cas	2015		AmC AmS	4	Ducháček et al. in Lustyk & Doležal 2018, this study*
Cydonia oblonga	Mill.	Rosa	ar LM	cas			M	20	Kovanda in KČR 3
Cymbalaria muralis subsp. *muralis*	G. Gaertn. et al.	Plan	ar LM	nat			M	168	Slavík in KČR 6
Cymbalaria pallida	(Ten.) Wettst.	Plan	neo 3	nat			M	18	Slavík in KČR 6, Láníková in Hadinec & Lustyk 2011
Cynodon dactylon	(L.) Pers.	Poac	ar *	nat			As Af	66	Šumberová in Kaplan et al. 2023
Cynosurus echinatus	L.	Poac	neo 3	cas			M	1	Kaplan et al. 2019a
Cyperus congestus	Vahl	Cype	neo 4	cas	2009		Af	1	this study*
Cyperus difformis	L.	Cype	neo 4	cas	1960	1960	M As Af Au	1	this study*, Kubát in KČR 9
Cyperus eragrostis	Lam.	Cype	neo 3	cas	1999		AmN & C & S	6	Petřík 2003, Drlíková & Grulich in Hadinec & Lustyk 2017
Cyperus glomeratus	L.	Cype	neo 2	cas	1895		E As	1	Kaplan et al. 2019a, Kubát in KČR 9
Cyperus rotundus	L.	Cype	neo 3	cas	1960		M	1	Dvořák & Kühn 1966
Cypripedium reginae	Walter	Orch	neo 2	cas	1935	1941	AmN	1	Dostál 1948–1950, Šuk 2001
Cystopteris bulbifera	(L.) Bernh.	Wood	neo 3	cas	1985		AmN	2	Ekrt in Kaplan et al. 2018b
Cytisus scoparius subsp. *scoparius*	(L.) Link	Faba	neo 1	nat	1819		E	554	Řepka in Kaplan et al. 2021
Dactyloctenium aegyptium	(L.) Willd.	Poac	neo 2	cas			As Af	4	Kaplan et al. 2019a
Dahlia pinnata	Cav.	Aste	neo 2	cas			AmN	14	Bělohlávková in KČR 7
Darmera peltata	(Benth.) Voss	Saxi	neo 3	cas	1960		AmN	1	Král et al. 2004c
Dasiphora fruticosa	(L.) Rydb.	Rosa	neo 3	cas	1977		E As	36	Pyšek et al. 2002
Dasypyrum villosum	(L.) P. Candargy	Poac	neo 2	cas	1920	1960	M	1	Kaplan et al. 2019a
Datura ferox	L.	Sola	neo 3	cas	1987		As	1	Štěpánek in KČR 6
Datura inoxia	Mill.	Sola	neo 2	cas	1934		AmN & C & S	16	Štěpánek in KČR 6
Datura stramonium var. *stramonium*	L.	Sola	ar/neo	nat	1809		As	23	Štěpánek in KČR 6*
Datura stramonium var. *tatula*	(L.) Torr.	Sola	neo 2	nat	1934		AmN	31	Krist 1935*
Daucus carota subsp. *sativus*	(Hoffm.) Schübl. et G. Martens	Apia	ar LM	cas			anec	11	Tomšovic in KČR 5
Delphinium grandiflorum	L.	Ranu	neo 4	cas	2016		As	1	Uher in Lustyk & Doležal 2020, this study*
Descurainia sophia	(L.) Prantl	Bras	ar BR	nat			M As	485	Šumberová in Kaplan et al. 2023
Deutzia scabra	Thunb.	Hydrn	neo 4	cas	2001		As	43	Pyšek et al. 2002
Dianthus barbatus subsp. *barbatus*	L.	Cary	ar/neo	nat	1874		E	64	Kovanda in KČR 2
Dianthus caryophyllus	L.	Cary	ar/neo	cas			M	3	Kovanda in KČR 2
Dianthus chinensis	L.	Cary	neo 2	cas			As	14	Kovanda in KČR 2

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Dicentra formosa	Walp.	Papa	neo 4	nat	2010		AmN	3	Mikoláš in Hadinec & Lustyk 2016, Doležal & Novák in Lustyk & Doležal 2021, this study*
Dichanthelium oligosanthes	(Schult.) Gould	Poac	neo 2	cas	1931	1931	AmC AmS	1	Rozum in Rohlena 1931
Dichanthium sericeum	(R. Br.) A. Camus	Poac	neo 3	cas	1959	1960	Au	1	Dvořák & Kühn 1966
Dichondra argentea	Willd.	Conv	neo 4	cas	2018		AmN & C & S	1	Zdvořák in Lustyk & Doležal 2019, this study*
Diervilla lonicera	Mill.	Dier	neo 3	cas			AmN	1	Chrtek in KČR 5
Digitalis lanata	Ehrh.	Plan	neo 2	cas	1881		E	14	Kubát in KČR 6
Digitalis lutea	L.	Plan	neo 2	cas	1872		E	9	Kubát in KČR 6
Digitalis purpurea	L.	Plan	ar/neo	nat	1790		E M	380	Kubát in KČR 6
Digitaria ciliaris	(Retz.) Koeler	Poac	neo 2	cas	1908	1926	As Af	2	Danihelka in Hadinec & Lustyk 2011, Danihelka & Ducháček in Kaplan et al. 2017b
Digitaria ischaemum	(Schreb.) Muhl.	Poac	ar NE	inv			M	385	Danihelka & Ducháček in Kaplan et al. 2017b
Digitaria sanguinalis	(L.) Scop.	Poac	ar NE	inv			M	451	Danihelka & Ducháček in Kaplan et al. 2017b*
Dinebra retroflexa	(Vahl) Panz.	Poac	neo 3	cas	1965		As Af	1	Dvořák & Frank 1975, Kaplan et al. 2019a
Diplotaxis muralis	(L.) DC.	Bras	ar *	nat			M	84	Smejkal in KČR 3
Diplotaxis tenuifolia	(L.) DC.	Bras	ar *	nat			M	58	Smejkal in KČR 3
Dipsacus sativus	(L.) Honck.	Dips	ar/neo	cas			anec	19	Štěpánek & Holub in KČR 5
Dipsacus strigosus	Roem. et Schult.	Dips	neo 2	nat	1864		E M	80	Lhotská 1968, Štěpánek & Holub in KČR 5
Dittrichia graveolens	(L.) Greuter	Aste	neo 4	inv	2008		M	91	Raabe in Hadinec & Lustyk 2009, Király et al. in Hadinec & Lustyk 2015, Ducháček et al. in Kaplan et al. 2018a*
Doronicum columnae	Ten.	Aste	neo *	nat			E	12	Pyšek et al. 2002, Štech in KČR 7
Doronicum orientale	Hoffm.	Aste	neo 2	cas	1819		E M	6	Čelakovský 1885, Pyšek et al. 2002, Štech in KČR 7
Doronicum pardalianches	L.	Aste	neo 2	nat	1897		E	3	Štech in KČR 7*
Draba sibirica	(Pall.) Thell.	Bras	neo 3	cas	1963	1963	As	2	Chrtek 1978, Kaplan in Kaplan et al. 2021
Dracocephalum moldavica	L.	Lami	neo 2	cas	1854		As	23	Kaplan in Kaplan et al. 2021
Dracocephalum parviflorum	Nutt.	Lami	neo 2	cas	1928	1928	AmN	1	Danihelka 2019, Danihelka in Kaplan et al. 2021, this study*
Dracocephalum thymiflorum	L.	Lami	neo 3	cas	1958	1968	E As	5	Hejný et al. 1973, Kaplan in Kaplan et al. 2021
Duchesnea indica	(Jacks.) Focke	Rosa	neo 3	nat	1960		As	42	Smejkal 1975b, Křísa in KČR 4
Dysphania ambrosioides	(L.) Mosyakin et Clemants	Amara	neo 2	cas	1831		AmS	21	Kaplan et al. in Kaplan et al. 2017a
Dysphania botrys	(L.) Mosyakin et Clemants	Amara	ar *	nat			M As	107	Kaplan et al. in Kaplan et al. 2017a
Dysphania melanocarpa	(J. M. Black) Mosyakin et Clemants	Amara	neo 3	cas	1959	1959	Au	1	Kaplan et al. in Kaplan et al. 2017a
Dysphania pumilio	(R. Br.) Mosyakin et Clemants	Amara	neo 2	nat	1890		Au	83	Kaplan et al. in Kaplan et al. 2017a
Dysphania schraderiana	(Schult.) Mosyakin et Clemants	Amara	neo 2	cas	1894		Af	16	Kaplan et al. in Kaplan et al. 2017a
Ecballium elaterium	(L.) A. Rich.	Cucu	neo 2	cas	1880		M	3	Chrtková in KČR 2
Echinacea purpurea	(L.) Moench	Aste	neo 4	cas			AmN	1	this study*
Echinochloa colona	(L.) Link	Poac	neo 3	cas			M	1	Kaplan et al. 2019a
Echinochloa crus-galli	(L.) P. Beauv.	Poac	ar NE	inv			anec	541	Kaplan et al. 2019a
Echinochloa esculenta	(A. Braun) H. Scholz	Poac	neo 3	cas	1981	1981	As	1	Jehlík 1998, Jehlík 2013
Echinochloa frumentacea	Link	Poac	neo 3	cas			As	1	Dostál 1989, Kaplan et al. 2019a
Echinochloa muricata	(P. Beauv.) Fernald	Poac	neo 3	cas	1968	1974	AmN	4	Jehlík 1998, Jehlík 2013
Echinochloa oryzoides	(Ard.) Fritsch	Poac	neo 3	cas	1950		M	1	Hejný 1950–1951, Hejný et al. 1973, Kaplan et al. 2019a
Echinocystis lobata	(Michx.) Torr. et A. Gray	Cucu	neo 2	inv	1941		AmN	260	Slavík & Lhotská 1967, Chrtková in KČR 2, Rydlo 2000, Sutorý 2000
Echinops bannaticus	Schrad.	Aste	neo 2	cas	1942		E	22	Koutecký in Kaplan et al. 2019b, this study*
Echinops exaltatus	Schrad.	Aste	neo 2	nat	1932		E	28	Koutecký in Kaplan et al. 2019b
Echinops sphaerocephalus subsp. *sphaerocephalus*	L.	Aste	neo 2	inv	1802		E M	421	Koutecký in Kaplan et al. 2019b
Echium plantagineum	L.	Bora	neo 2	cas	1940	1940	M	1	Klotz 1963, Kaplan in Kaplan et al. 2023

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Eclipta prostrata	(L.) L.	Aste	neo 4	cas	2021		AmN & C & S	1	Doležal & Řepka in Lustyk & Doležal 2022, this study*
Egeria densa	Planch.	Hydro	neo 3	cas	1963		AmS	6	Kaplan in Kaplan et al. 2018a
Ehrharta longiflora	Sm.	Poac	neo 3	cas	1963		Af	1	Dvořák & Kühn 1966
Eichhornia crassipes	(Mart.) Solms	Pont	neo 3	cas	1991		AmS	16	Kaplan in Kaplan et al. 2016a
Elaeagnus angustifolia	L.	Elae	neo 2	cas			E M As	57	Koblížek in KČR 5
Elaeagnus commutata	Rydb.	Elae	neo 3	nat	1974		AmN	3	Pyšek et al. 2012b
Eleusine coracana subsp. *coracana*	(L.) Gaertn.	Poac	neo 4	cas	2000		Af	2	Kaplan in Hadinec & Lustyk 2014, this study*
Eleusine indica	(L.) Gaertn.	Poac	neo 3	cas	1963		As Af	7	Dvořák & Kühn 1966, Kaplan in Hadinec & Lustyk 2014, Řepka in Lustyk & Doležal 2019
Eleusine tristachya	(Lam.) Lam.	Poac	neo 4	cas			AmS	2	Kaplan in Hadinec & Lustyk 2014, this study*
Elodea canadensis	Michx.	Hydro	neo 2	nat	1878		AmN	457	Pyšek & Mandák 1998, Kaplan in Kaplan et al. 2018a
Elodea nuttallii	(Planch.) H. St. John	Hydro	neo 3	inv	1988		AmN	22	Rydlo in Hadinec & Lustyk 2015, Kaplan in Kaplan et al. 2018a*
Elsholtzia ciliata	(Thunb.) Hyl.	Lami	neo 2	cas			As	15	Cejp 1948, Slavíková in KČR 6*
Elymus canadensis	L.	Poac	neo 3	cas			AmN	3	Kaplan et al. 2019a
Elymus obtusiflorus	(DC.) Conert	Poac	neo 4	cas	2020		E	1	Ducháček & Doležal in Lustyk & Doležal 2021, this study*
Epilobium adenocaulon	Hausskn.	Onag	neo 2	nat	1926		AmN AmC	638	Danihelka in Kaplan et al. 2018a
Epilobium brachycarpum	C. Presl	Onag	neo 4	nat	2016		AmN	6	Salák & Hadinec in Hadinec & Lustyk 2017, Danihelka in Kaplan et al. 2018a, this study*
Epilobium ×floridulum	Smejkal	Onag	neo *	cas	1980		hybrid	7	Smejkal 1995, Smejkal in KČR 5
Epilobium ×fossicola	Smejkal	Onag	neo *	cas			hybrid	36	Smejkal 1995, Smejkal in KČR 5
Epilobium ×iglaviense	Smejkal	Onag	neo *	cas	1979		hybrid	7	Smejkal 1995, Smejkal in KČR 5
Epilobium ×interjectum	Smejkal	Onag	neo *	cas	1987		hybrid	11	Smejkal 1995, Smejkal in KČR 5
Epilobium ×josefi-holubii	Krahulec	Onag	neo *	cas	1997		hybrid	1	Krahulec 1999
Epilobium komarovianum	H. Lév.	Onag	neo 3	cas	1964	1991	Au	3	Řehořek 1974, Holub 1978a, Stanzel 1994, Danihelka in Kaplan et al. 2018a
Epilobium ×mentiens	Smejkal	Onag	neo *	cas	1987		hybrid	1	Smejkal 1995, Smejkal in KČR 5
Epilobium ×novae-civitatis	Smejkal	Onag	neo *	cas	1972		hybrid	13	Smejkal 1974, Smejkal in KČR 5
Epilobium ×nutantiflorum	Smejkal	Onag	neo *	cas	1976		hybrid	25	Smejkal 1995, Smejkal in KČR 5
Epilobium ×prochazkae	Krahulec	Onag	neo *	cas	1997		hybrid	1	Krahulec 1999
Epilobium ×vicinum	Smejkal	Onag	neo *	cas	1971		hybrid	21	Smejkal 1995, Smejkal in KČR 5
Epimedium ×perralchicum	Stearn	Berb	neo 4	cas	2014		hybrid	1	Uher in Lustyk & Doležal 2020, this study*
Epimedium alpinum	L.	Berb	neo 2	cas	1874		E	3	Zelený in KČR 1
Eragrostis albensis	H. Scholz	Poac	neo 3	nat	1968		anec	22	Kaplan et al. 2019a, Špryňar & Kubát 2004*
Eragrostis cilianensis	(All.) Janch.	Poac	neo 3	cas	1961	1965	M As	1	Dvořák & Kühn 1966, Grüll 1979
Eragrostis mexicana	(Hornem.) Link	Poac	neo 3	cas	1966		AmN	1	Dostál 1989, Kaplan et al. 2019a
Eragrostis minor	Host	Poac	ar *	inv			M	370	Kaplan et al. 2019a
Eragrostis multicaulis	Steud.	Poac	neo 3	cas	1961		As	3	Dvořák & Kühn 1966, Dostál 1989, Kaplan et al. 2019a
Eragrostis pectinacea	(Michx.) Nees	Poac	neo 2	cas	2000		AmN AmC	5	Špryňar & Kubát 2004
Eragrostis pilosa	(L.) P. Beauv.	Poac	neo 2	nat	1902		As	13	Špryňar & Kubát 2004*
Eragrostis suaveolens	Claus	Poac	neo 3	cas	1961	1961	M	1	Dvořák & Kühn 1966
Eragrostis tef	(Zuccagni) Trotter	Poac	neo 3	cas	1965		M	4	Kubát 1979, Kaplan et al. 2019a
Eranthis hyemalis	(L.) Salisb.	Ranu	neo 3	nat			M	35	Chrtková in KČR 1
Erechtites hieraciifolius	(L.) DC.	Aste	neo 2	inv	1895		AmN	267	Panek 1895, Hadinec in Hadinec & Lustyk 2011*
Erigeron annuus	(L.) Desf.	Aste	neo 2	inv			AmN	442	Šída in KČR 7, Pyšek et al. 2012b, Šída in Kaplan et al. 2019a*
Erigeron speciosus	(Lindl.) DC.	Aste	neo 2	cas	1888	1888	AmN	1	Šída in KČR 7
Erigeron strigosus	Willd.	Aste	neo 2	nat			AmN	41	Šída in KČR 7
Eriochloa procera	(Retz.) C. E. Hubb.	Poac	neo 3	cas	1960	1965	As Af Au	1	Kaplan & Danihelka in Hadinec & Lustyk 2014*
Eriochloa villosa	(Thunb.) Kunth	Poac	neo 4	cas	2013		As	1	Paulič & Němec 2014, this study*
Erodium botrys	(Cav.) Bertol.	Gera	neo 3	cas	1956		M	2	Slavík 1996a, Slavík in KČR 5
Erodium cicutarium	(L.) L'Hér.	Gera	ar BR	nat			E M As	534	Slavík in KČR 5
Erodium gruinum	(L.) L'Hér.	Gera	neo 2	cas	1897	1968	M	1	Domin 1918, Slavík in KČR 5
Erodium manescavii	Gaston-Sacaze	Gera	neo 4	cas	2016		E	1	Doležal in Lustyk & Doležal 2020, this study*
Erodium moschatum	(L.) L'Hér.	Gera	neo 2	cas	1855		M	3	Slavík in KČR 5
Erodium neuradifolium	Godr.	Gera	neo 3	cas	1986		M	1	Slavík 1996b, Slavík in KČR 5
Eruca sativa	Mill.	Bras	ar/neo	cas	1900		M	5	Zelený in KČR 3

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Erucastrum gallicum	(Willd.) O. E. Schulz	Bras	neo 2	nat	1867		E	89	Štěpánek 1983, Štěpánek in KČR 3
Erucastrum nasturtiifolium	(Poir.) O. E. Schulz	Bras	neo 2	nat	1870		E M	27	Štěpánek 1983, Štěpánek in KČR 3
Eryngium amethystinum	L.	Apia	neo 3	cas	1966		M	1	Tomšovic in KČR 5
Eryngium giganteum	M. Bieb.	Apia	neo 3	cas	1995		E M	1	Tomšovic in KČR 5
Erysimum capitatum var. *purshii*	(Durand) Rollins	Bras	neo 2	cas	1942		AmN	1	Kirschner & Štěpánek 1984, Štěpánek in KČR 3
Erysimum cheiranthoides subsp. *cheiranthoides*	L.	Bras	ar *	nat			E M As	474	Štěpánek in KČR 3
Erysimum cheiri	(L.) Crantz	Bras	ar/neo	cas	1819		M	15	Dvořák in KČR 3*
Erysimum repandum	L.	Bras	ar *	cas			E	124	Štěpánek in KČR 3
Erythronium dens-canis	L.	Lili	ar/neo	nat	1819		E	12	Kaplan in Hadinec et al. 2005, Sádlo 2009, Bělohlávková in KČR 8
Eschscholzia californica	Cham.	Papa	neo 3	cas			AmN	8	Kubát in KČR 1
Euclidium syriacum	(L.) W. T. Aiton	Bras	ar *	cas			M	5	Kirschner & Sutorý in KČR 3
Euphorbia agraria	M. Bieb.	Euph	neo 4	cas	2005		E	2	Čáp in Hadinec et al. 2005, Danihelka et al. in Kaplan et al. 2023
Euphorbia exigua	L.	Euph	ar LM	nat			M	330	Chrtek & Křísa in KČR 3, Danihelka et al. in Kaplan et al. 2023
Euphorbia falcata	L.	Euph	ar *	nat			M	111	Chrtek & Křísa in KČR 3, Danihelka et al. in Kaplan et al. 2023
Euphorbia helioscopia	L.	Euph	ar NE	nat			M	586	Chrtek & Křísa in KČR 3, Danihelka et al. in Kaplan et al. 2023
Euphorbia humifusa	Willd.	Euph	neo 2	cas	1904		As	9	Dostál et al. 1948–1950, Kaplan et al. 2019a, Šumberová et al. in Lustyk & Doležal 2019, Danihelka et al. in Kaplan et al. 2023
Euphorbia lagascae	Spreng.	Euph	neo 3	cas	1974	1977	M	1	Unar 1978, Chrtek & Křísa in KČR 3, Danihelka et al. in Kaplan et al. 2023
Euphorbia lathyris	L.	Euph	neo 2	cas	1872		M	154	Chrtek & Křísa in KČR 3, Danihelka et al. in Kaplan et al. 2023
Euphorbia maculata	L.	Euph	neo 2	nat	1903		AmN	33	Dostál et al. 1948–1950, Černoch 1955, Hadač 1971, Šumberová et al. in Lustyk & Doležal 2019, Danihelka et al. in Kaplan et al. 2023*
Euphorbia marginata	Pursh	Euph	neo 3	cas	1967		AmN	50	Chrtek & Křísa in KČR 3, Danihelka et al. in Kaplan et al. 2023
Euphorbia myrsinites	L.	Euph	neo 3	cas	1925		E As	7	Pyšek et al. 2012b, Danihelka et al. in Kaplan et al. 2023
Euphorbia nutans	Lag.	Euph	neo 4	cas	1981		AmN & C & S	2	Danihelka et al. in Kaplan et al. 2023, this study*
Euphorbia peplus	L.	Euph	ar EM	nat			M	507	Chrtek & Křísa in KČR 3, Danihelka et al. in Kaplan et al. 2023
Euphorbia prostrata	Aiton	Euph	neo 4	cas	2013		AmN & C & S	5	Hlisnikovský in Hadinec & Lustyk 2014, Šumberová et al. in Lustyk & Doležal 2019, Danihelka et al. in Kaplan et al. 2023, this study*
Euphorbia saratoi	Ardoino	Euph	neo *	nat	1921		E As	51	Danihelka et al. in Kaplan et al. 2023, this study*
Euphorbia serpens	Kunth	Euph	neo 4	cas	2017		AmN & C & S	3	Sádlo in Lustyk & Doležal 2018, Danihelka et al. in Kaplan et al. 2023, this study*
Euphorbia taurinensis	All.	Euph	neo 2	cas	1922		M	20	Chrtek & Křísa 1970, Smejkal & Dvořáková 1975, Hlisnikovský & Kocián 2014, Danihelka et al. in Kaplan et al. 2023
Euphrasia salisburgensis	Funck	Orob	neo 2	cas	1901		E	1	Štursa et al. 2009, Pyšek et al. 2012b
Eurybia divaricata	(L.) G. L. Nesom	Aste	neo 2	cas			AmN	2	Pyšek & Vobořil 2002, Kovanda & Kubát in KČR 7
Eurybia macrophylla	(L.) Cass.	Aste	neo 2	cas			AmN	1	Kovanda & Kubát in KČR 7
Fagopyrum esculentum	Moench	Polgn	ar EM	cas			anec	177	Chrtek in KČR 2
Fagopyrum tataricum	(L.) Gaertn.	Polgn	neo 2	cas	1880		As	6	Chrtek in KČR 2
Fallopia aubertii	(L. Henry) Holub	Polgn	neo 2	nat	1850		As	58	Domin 1917
Ferulago confusa	Velen.	Apia	neo 3	cas	1998		M	2	Rotreklová & Řehořek in Hadinec & Lustyk 2009
Festuca arundinacea × *Lolium multiflorum*		Poac	neo 3	nat			hybrid	1	Vojík et al. 2020, this study*
×*Festulolium braunii*	(K. Richt.) A. Camus	Poac	neo 3	nat			hybrid	1	Pyšek et al. 2012b, Vojík et al. 2020, this study*
Fibigia clypeata	(L.) Medik.	Brass	neo 4	cas	2017		M As	2	Láníková in Lustyk & Doležal 2020, this study*

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Ficus carica	L.	Mora	ar/neo	cas			M	7	Eitel 1982, Zelený in KČR 1
Filago pyramidata	L.	Aste	neo 2	cas	1833		E M	1	Eitel 1982, Zelený in KČR 1
Filipendula kamtschatica	(Pall.) Maxim.	Rosa	neo 2	cas	1940		As	2	Smrček & Malina 1984, Smejkal in KČR 4
Foeniculum vulgare	Mill.	Apia	ar LM	cas			M	13	Tomšovic in KČR 5
Forsythia suspensa	(Thunb.) Vahl	Olea	neo 2	cas			As	57	Pyšek et al. 2002
Fragaria ×ananassa	(Weston) Rozier	Rosa	neo 2	nat			anec	30	Křísa in KČR 4
Fraxinus ornus	L.	Olea	neo 3	cas	1950		E M	24	Pyšek et al. 2002
Fraxinus pennsylvanica	Marshall	Olea	neo 3	inv			AmN	56	Koblížek in KČR 5
Fritillaria meleagris	L.	Lili	neo 2	cas	1819		E	2	Bělohlávková in KČR 8
Fumaria capreolata	L.	Papa	neo 2	cas	1918	1918	M	1	Domin 1918
Fumaria officinalis	L.	Papa	ar BR	nat			M	512	Smejkal in KČR 1, Danihelka in Kaplan et al. 2019a*
Fumaria parviflora	Lam.	Papa	neo *	cas			M	1	Smejkal in KČR 1
Fumaria rostellata	Knaf	Papa	ar *	nat			M	131	Smejkal in KČR 1
Fumaria schleicheri	Soy.-Will.	Papa	ar *	nat			M	99	Smejkal in KČR 1
Fumaria vaillantii	Loisel.	Papa	ar BR	nat			M	150	Smejkal in KČR 1*
Gagea villosa	(M. Bieb.) Sweet	Lili	ar *	nat			M	245	Hroneš et al. in Kaplan et al. 2017b
Gaillardia ×grandiflora	Van Houtte	Aste	neo 4	cas	2003		anec	3	Uher in Lustyk & Doležal 2019
Gaillardia pulchella	Foug.	Aste	neo 3	cas			AmN	1	Bělohlávková in KČR 7
Galanthus elwesii	Hook. f.	Amary	neo 4	cas	2007		E	2	Sekerka in Lustyk & Doležal 2020, this study*
Galega officinalis	L.	Faba	ar/neo	nat			E M	142	Chrtková in KČR 4
Galega orientalis	Lam.	Faba	neo 4	cas	2020		E	1	Čepelová in Lustyk & Doležal 2021, this study*
Galeobdolon argentatum	Smejkal	Lami	neo 2	nat			anec	377	Smejkal 1975a, Dvořáková in KČR 6
Galeopsis segetum	Neck.	Lami	neo 2	cas	1835	1995	E	18	Danihelka & Štěpánková in Kaplan et al. 2019b
Galinsoga parviflora	Cav.	Aste	neo 2	inv	1880		AmS	525	Slavík in KČR 7
Galinsoga quadriradiata	Ruiz et Pav.	Aste	neo 2	inv	1901		AmC AmS	540	Slavík in KČR 7
Galium murale	(L.) All.	Rubi	neo 4	cas	2009		E	1	Prančl in Hadinec & Lustyk 2012
Galium parisiense	L.	Rubi	neo 2	cas	1835		E M	4	Kaplan & Řehořek 1998, Kaplan in KČR 6
Galium rubioides	L.	Rubi	neo 2	cas	1838	1927	E	6	Štěpánková in Kaplan et al. 2019b
Galium spurium subsp. *spurium*	L.	Rubi	ar NE	nat			E M	257	Kaplan in KČR 6
Galium tricornutum	Dandy	Rubi	ar BR	cas			M	121	Kaplan in KČR 6, Štefánek in Hadinec et al. 2005
Galium verrucosum	Huds.	Rubi	neo 2	cas	1822		M	22	Kaplan in KČR 6
Gastridium ventricosum	(Gouan) Schinz et Thell.	Poac	neo 3	cas	1961	1961	M	1	Dvořák & Kühn 1966
Gaudinia fragilis	(L.) P. Beauv.	Poac	neo *	cas			M	1	Dostál 1989, Kaplan et al. 2019a
Gaura lindheimeri	Engelm. et A. Gray	Onag	neo 4	cas	2016		AmN	2	Koritta in Lustyk & Doležal 2019, this study*
Genista sagittalis	L.	Faba	neo 2	nat	1928		E	17	Skalická 1993, Skalická in KČR 4
Gentiana lutea subsp. *lutea*	L.	Gent	neo 1	nat			E	8	Kirschner & Kirschnerová in KČR 6
Gentiana purpurea	L.	Gent	neo *	cas	2005		E	1	Bureš 2019, this study*
Gentianella obtusifolia subsp. *norica*	(A. Kern. et Jos. Kern.) Holub	Gent	neo 2	cas	1901	1901	E	1	Štursa et al. 2009
Geranium aequale	(Bab.) Aedo	Gera	neo 4	cas	2013		E	2	Hlisnikovský in Hadinec & Lustyk 2015, this study*
Geranium dissectum	L.	Gera	ar EM	nat			M	447	Slavík in KČR 5
Geranium ibericum	Cav.	Gera	neo 3	cas	1965		M	1	Slavík 1997a, b, Slavík in KČR 5
Geranium macrorrhizum	L.	Gera	neo *	nat			E M	28	Slavík 1997a, b, Slavík in KČR 5
Geranium molle subsp. *molle*	L.	Gera	ar EM	nat			M	114	Hlaváček in Lustyk & Doležal 2019
Geranium purpureum	Vill.	Gera	neo 4	nat	2005		M	54	Růžička & Koblížek 2009, Chrtek et al. in Hadinec & Lustyk 2014*
Geranium pusillum	L.	Gera	ar IR	nat			E M	592	Slavík 1997a, b, Slavík in KČR 5
Geranium pyrenaicum	Burm. f.	Gera	neo 2	nat	1819		M	372	Slavík 1997a, b, Slavík in KČR 5
Geranium reflexum	L.	Gera	neo 3	cas	1992		M	2	Slavík in KČR 5
Geranium rotundifolium	L.	Gera	neo 2	cas	1851		E M	23	Slavík 1997a, b, Slavík in KČR 5
Geranium sibiricum	L.	Gera	neo 2	nat	1850		E As	11	Slavík 1997a, b, Slavík in KČR 5, Fajmon et al. in Hadinec & Lustyk 2008
Geranium thunbergii	Lindl. et Paxton	Gera	neo 4	cas	2013		As	1	Uher in Hadinec & Lustyk 2015, this study*
Geranium versicolor	L.	Gera	neo 3	cas	1986		M	1	Chrtek 1989, Slavík in KČR 5
Geum aleppicum	Jacq.	Rosa	neo 2	cas	1923		E As	9	Domin 1923, Smejkal 1988, 1989b, Smejkal in KČR 4
Geum macrophyllum	Willd.	Rosa	neo 3	cas	1956		AmN As	1	Smejkal in KČR 4

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Geum ×spurium	Fisch. et C. A. Mey.	Rosa	neo *	cas			hybrid	1	Smejkal in KČR 4
Gilia achilleifolia	Benth.	Pole	neo *	cas			AmN	1	Křísa in KČR 6
Gilia capitata	Sims	Pole	neo 3	cas	1982		AmN	1	Pyšek et al. 2002
Gilia tricolor	Benth.	Pole	neo *	cas			AmN	1	Křísa in KČR 6
Glaucium corniculatum	(L.) Rudolph	Papa	ar BR	cas			M	48	Kubát in Kaplan et al. 2018b
Glaucium flavum	Crantz	Papa	ar BR	cas			M	1	Kubát in KČR 1
Glebionis coronaria	(L.) Spach	Aste	neo 2	cas	1879		M	5	Zelený in KČR 7
Glebionis segetum	(L.) Fourr.	Aste	neo 2	cas	1872		M	6	Zelený in KČR 7
Gleditsia triacanthos	L.	Faba	neo 4	cas	2008		AmN	43	Pyšek et al. 2012b
Glyceria striata	(Lam.) Hitchc.	Poac	neo 3	nat	1995		AmN	6	Dančák 2002, Dančák & Trávníček in Kaplan et al. 2015
Glycine max	(L.) Merr.	Faba	neo 3	cas	1958		anec	10	Chrtková in KČR 4
Glycyrrhiza glabra	L.	Faba	ar/neo	nat			M	13	Chrtková in KČR 4
Gratiola neglecta	Torr.	Plan	neo 2	cas	1941		AmN	3	Šumberová & Ducháček 2009, Šumberová & Ducháček in Kaplan et al. 2016b
Guizotia abyssinica	(L. f.) Cass.	Aste	neo 2	cas	1892		Af	2	Domin 1919
Gypsophila elegans	M. Bieb.	Cary	neo 2	cas	1911		E M	14	Danihelka & Šumberová in Kaplan et al. 2017b
Gypsophila perfoliata	L.	Cary	neo 3	nat	1965		E As	4	Danihelka & Šumberová in Kaplan et al. 2017b, this study*
Gypsophila scorzonerifolia	Ser.	Cary	neo 2	nat	1947		M	12	Danihelka & Šumberová in Kaplan et al. 2017b
Helianthemum nummularium subsp. *nummularium*	(L.) Mill.	Cist	neo *	cas			E M	266	Hrouda in KČR 2
Helianthus annuus	L.	Aste	neo 1	cas	1872		AmN	223	Jehlík 1998, Kirschner & Šída in KČR 7
Helianthus ×laetiflorus	Pers.	Aste	neo 2	nat			anec	71	Kirschner & Šída in KČR 7
Helianthus pauciflorus	Nutt.	Aste	neo 3	nat			AmN	13	Kirschner & Šída in KČR 7
Helianthus petiolaris	Nutt.	Aste	neo 3	cas	1974		AmN	1	Kirschner & Šída in KČR 7
Helianthus salicifolius	A. Dietr.	Aste	neo 3	cas	1973		AmN	1	Kirschner & Šída in KČR 7
Helianthus strumosus	L.	Aste	neo *	cas			AmN	1	Pyšek et al. 2002, Kirschner & Šída in KČR 7
Helianthus tuberosus	L.	Aste	neo 2	inv	1885		AmN	334	Kirschner & Šída in KČR 7
Helichrysum thianschanicum	Regel	Aste	neo 2	cas	1941		As	1	Štech in KČR 7
Heliopsis helianthoides	(L.) Sweet	Aste	neo 2	cas			AmN	8	Bělohlávková in KČR 7
Heliotropium europaeum	L.	Bora	ar *	cas			M	4	Slavík in KČR 6, Žáková in Hadinec & Lustyk 2007
Helleborus foetidus	L.	Ranu	neo 2	cas			E M	7	Chrtková in KČR 1
Helleborus niger	L.	Ranu	ar/neo	cas	1874		E M	7	Chrtková in KČR 1
Helleborus odorus	Willd.	Ranu	neo *	cas			E M	2	Chrtková in KČR 1
Helleborus orientalis	Lam.	Ranu	neo 2	cas	2012		E	11	Pyšek et al. 2012b
Helleborus viridis	L.	Ranu	ar/neo	cas	1819		E	14	Chrtková in KČR 1
Helminthotheca echioides	(L.) Holub	Aste	neo 2	cas	1861		M	9	Štěpánek in KČR 7
Hemerocallis fulva	(L.) L.	Xant	neo 2	cas	1883		As	160	Bělohlávková in KČR 8
Hemerocallis lilioasphodelus	L.	Xant	neo 2	cas	1883		As	12	Bělohlávková in KČR 8
Heracleum mantegazzianum	Sommier et Levier	Apia	neo 2	inv	1877		E	379	Danihelka et al. 2020b
Heracleum persicum	Fisch.	Apia	neo 3	cas	1960		M	2	Holub in KČR 5
Heracleum sosnowskyi	Manden.	Apia	neo 4	cas	2018		E As	1	Doležal et al. in Lustyk & Doležal 2020, this study*
Herniaria cinerea	DC.	Cary	neo 3	cas	1960		M	1	Sutorý in KČR 2
Herniaria hirsuta	L.	Cary	ar *	nat			M	59	Sutorý in KČR 2
Herniaria incana	Lam.	Cary	neo 3	cas	1986		E As	1	Hlaváček 1989, 1991, Hlaváček & Pyšek 1992
Hesperis matronalis subsp. *candida*	(Schulzer et al.) Thell.	Bras	neo 2	cas	1909		E	3	Dvořák 1968, Dvořák in KČR 3*
Hesperis matronalis subsp. *matronalis*	L.	Bras	ar/neo	nat	1817		E M	28	Dvořák 1968, Dvořák in KČR 3
Hesperis matronalis subsp. *schurii*	Soó	Bras	neo 2	cas	1933		E	1	Dvořák 1968, Dvořák in KČR 3
Hesperis pycnotricha	Borbás et Degen	Bras	neo 3	cas	1950		E	1	Dvořák in KČR 3
Hibiscus syriacus	L.	Malv	neo 4	cas			As	8	this study*
Hibiscus trionum	L.	Malv	ar *	nat			M	32	Slavík in KČR 3
Hieracium heldreichii agg.		Aste	neo 3	cas	1978		E M	1	Pyšek et al. 2012b
Hieracium mixtum	Froel.	Aste	neo 4	cas	2006		E	1	Kocián & Chrtek in Hadinec & Lustyk 2011
Hippocrepis emerus	(L.) Lassen	Faba	neo 2	cas	1891		E M	1	Chrtková in KČR 4
Hippophaë rhamnoides	L.	Elae	neo 2	cas	1902		E M As	38	Pyšek et al. 2002
Hirschfeldia incana	(L.) Lagr.-Foss.	Bras	neo 3	cas	1956		M	5	Krčan & Kopecký 1960, Štěpánek in KČR 3, Jehlík 1998

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Hopia obtusa	(Kunth) Zuloaga et Morrone	Poac	neo 3	cas	1961		AmC AmS	1	Dvořák & Kühn 1966, Kaplan et al. 2019a
Hordeum brevisubulatum	(Trin.) Link	Poac	neo 3	cas	1974	1974	As	1	Danihelka in Hadinec & Lustyk 2009, Danihelka in Kaplan et al. 2018a
Hordeum geniculatum	All.	Poac	neo 2	cas	1851	1968	E M	7	Dvořák & Kühn 1966, Danihelka & Ducháček in Kaplan et al. 2018a
Hordeum jubatum	L.	Poac	neo 2	nat	1880		AmN	143	Ducháček in Kaplan et al. 2018a
Hordeum marinum	Huds.	Poac	neo 2	cas	1929		E M	4	Danihelka & Ducháček in Kaplan et al. 2018a
Hordeum murinum subsp. *leporinum*	(Link) Arcang.	Poac	neo 2	cas	1957	1990	M	5	Ducháček in Kaplan et al. 2018a
Hordeum murinum subsp. *murinum*	L.	Poac	ar EM	nat			M	298	Ducháček in Kaplan et al. 2018a
Hordeum secalinum	Schreb.	Poac	neo 2	cas	1929	1964	M	5	Ducháček in Kaplan et al. 2018a
Hordeum vulgare Distichon Group		Poac	ar ENE	cas			anec	185	Kaplan et al. 2019a
Hordeum vulgare Vulgare Group		Poac	ar ENE	cas			anec	2	Kaplan et al. 2019a
Hosta plantaginea	(Lam.) Asch.	Aspa	neo 3	cas			As	5	Pyšek et al. 2002
Houttuynia cordata	Thunb.	Saur	neo 4	cas	2016		As	1	Uher in Lustyk & Doležal 2018, this study*
Humulus scandens	(Lour.) Merr.	Cannab	neo *	cas			As	1	Chrtek in KČR 1
Hyacinthella leucophaea	(K. Koch) Schur	Aspa	neo 3	cas	1960		E	1	Šuk 2001
Hyacinthoides hispanica	(Mill.) Rothm.	Aspa	neo 4	cas	2007		M	9	Trávníček 2010
Hylotelephium anacampseros	(L.) H. Ohba	Cras	neo 3	cas			E	1	Grulich in KČR 3
Hylotelephium ewersii	(Ledeb.) H. Ohba	Cras	neo 3	cas			As	2	Grulich in KČR 3
Hylotelephium spectabile	(Boreau) H. Ohba	Cras	neo 3	cas			anec	15	Grulich in KČR 3
Hyoscyamus albus	L.	Sola	neo 2	cas	1890		M	1	Slavík in KČR 6
Hyoscyamus niger	L.	Sola	ar BR	nat			M As	287	Slavík in KČR 6
Hyparrhenia hirta	(L.) Stapf	Poac	neo 3	cas	1961	1961	M	1	Dvořák & Kühn 1966
Hypericum annulatum	Moris	Hype	neo 4	cas	2008		E	1	Sutorý 2010a, b
Hyssopus officinalis	L.	Lami	ar/neo	cas			M	29	Tomšovic in KČR 6
Iberis amara	L.	Bras	neo 2	cas	1888		M	2	Dvořáková in KČR 3
Iberis sempervirens	L.	Bras	neo 2	cas			M	3	Dvořáková in KČR 3
Iberis umbellata	L.	Bras	neo 2	cas	1880		M	26	Dvořáková in KČR 3
Impatiens balfourii	Hook. f.	Bals	neo 4	cas			As	1	Slavík in KČR 5
Impatiens balsamina	L.	Bals	neo 4	cas			As	1	Slavík in KČR 5
Impatiens edgeworthii	Hook. f.	Bals	neo 4	cas	2020		As	1	Uher in Lustyk & Doležal 2021, this study*
Impatiens glandulifera	Royle	Bals	neo 2	inv	1896		As	531	Daumann 1967, Slavík in KČR 5
Impatiens parviflora	DC.	Bals	neo 2	inv	1870		As	639	Vraštil 1952, Daumann 1967, Slavík in KČR 5
Impatiens scabrida	DC.	Bals	neo 3	cas	1986		As	3	Slavík in KČR 5
Inula helenium	L.	Aste	ar/neo	nat	1819		E M As	150	Hrouda in KČR 7
Inula racemosa	Hook. f.	Aste	neo 3	nat	1979		As	11	this study*
Ipomoea hederacea	(L.) Jacq.	Conv	neo 3	cas	1972		AmN & C & S	1	Kaplan et al. 2019a
Ipomoea lacunosa	L.	Conv	neo 3	cas			AmN	1	Jehlík 2013, this study*
Ipomoea purpurea	(L.) Roth	Conv	neo 3	cas	1969		AmC AmS	34	Křísa in KČR 6
Iris ×germanica	L.	Irid	ar/neo	nat			E As	79	Hrouda & Grulich in KČR 8
Iris pallida	Lam.	Irid	ar/neo	cas			M	3	Pyšek et al. 2002, Hrouda & Grulich in KČR 8
Iris ×sambucina	L.	Irid	ar/neo	nat			As	2	Hrouda & Grulich in KČR 8
Isatis tinctoria subsp. *praecox*	(Tratt.) Domin et Podp.	Bras	neo 2	cas	1921		M	1	Kirschner & Sutorý in KČR 3, Kaplan et al. 2019a
Isatis tinctoria subsp. *tinctoria*	L.	Bras	ar/neo	nat			M	9	Kirschner & Sutorý in KČR 3
Ismelia carinata	(Schousb.) Sch. Bip.	Aste	neo *	cas			Af	1	Zelený in KČR 7
Iva xanthiifolia	Nutt.	Aste	neo 2	nat	1947		AmN	54	Lhotská & Slavík 1969, Hejný et al. 1973, Jehlík 1998, Slavík in KČR 7
Juglans nigra	L.	Jugl	neo 2	nat			AmN	70	Vicherek et al. 2000, Pyšek et al. 2002*
Juglans regia	L.	Jugl	ar EM	inv			M	381	Pyšek et al. 2002*
Juncus ensifolius	Wikstr.	Junc	neo 4	cas	2001		AmN As	3	Kirschner & Prausová in Lustyk & Doležal 2020, this study*
Juncus tenuis	Willd.	Junc	neo 2	nat	1851		AmN	561	Kaplan et al. 2019a
Kickxia elatine subsp. *elatine*	(L.) Dumort.	Plan	ar EM	nat			M	52	Slavík in KČR 6, Kaplan in Hadinec & Lustyk 2007
Kickxia spuria subsp. *spuria*	(L.) Dumort.	Plan	ar LM	nat			M	109	Slavík in KČR 6

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Kitaibela vitifolia	Willd.	Malv	neo 4	cas	2020		E	1	Sádlo in Lustyk & Doležal 2022, this study*
Knautia macedonica	Griseb.	Dips	neo 4	cas	2018		E	1	Lepší & Lepší 2019, this study*
Kniphofia ×*praecox*	Baker	Xant	neo 4	cas	2020		hybrid	1	Szokala in Lustyk & Doležal 2021, this study*
Koelreuteria paniculata	Laxm.	Sapi	neo 4	cas	2002		As	8	Rydlo in Rydlo 2003, Pyšek et al. 2012b
Laburnum anagyroides	Medik.	Faba	neo 2	nat	1819		E M	126	Skalická in KČR 4
Lactuca sativa	L.	Aste	ar/neo	cas	1871		anec	71	Dřevojan in Kaplan et al. 2021
Lactuca serriola	L.	Aste	ar EM	inv			M	571	Dřevojan in Kaplan et al. 2021*
Lactuca tatarica	(L.) C. A. Mey.	Aste	neo 3	cas	1957	1997	M	18	Kilián & Krkavec 1963, Dřevojan in Kaplan et al. 2021
Lactuca virosa	L.	Aste	neo 2	cas	1851	1981	M	6	Dřevojan in Kaplan et al. 2021
Lagurus ovatus	L.	Poac	neo 3	cas			M	4	Dostál 1989, Kaplan et al. 2019a
Lamium album	L.	Lami	ar IR	nat			E M	576	Dvořáková in KČR 6
Lamium amplexicaule	L.	Lami	ar BR	nat			M	490	Dvořáková in KČR 6
Lamium confertum	Fr.	Lami	neo 2	cas	1862		E	1	Dvořáková 1965
Lamium ×*holsaticum*	E. H. L. Krause	Lami	ar *	cas			hybrid	12	Dvořáková in KČR 6
Lamium hybridum	Vill.	Lami	neo 2	cas	1901		E M	1	Otruba 1946, Dvořáková 1965
Lamium orvala	L.	Lami	neo 3	cas			E	1	Dvořáková in KČR 6
Lamium purpureum	L.	Lami	ar BR	nat			M	609	Dvořáková in KČR 6
Lappula patula	(Lehm.) Menyh.	Bora	neo 3	cas	1960	1973	E M As	2	Holub 1974, Kubát in Kaplan et al. 2018b
Lappula squarrosa	(Retz.) Dumort.	Bora	ar EM	nat			M As	173	Kubát in Kaplan et al. 2018b
Lathyrus annuus	L.	Faba	neo 2	cas			M	2	Chrtková & Bělohlávková in KČR 4
Lathyrus aphaca	L.	Faba	neo 2	nat			M	64	Chrtková et al. 1977, Chrtková & Bělohlávková in KČR 4
Lathyrus cicera	L.	Faba	neo 2	cas			M	2	Chrtková & Bělohlávková in KČR 4*
Lathyrus clymenum	L.	Faba	neo 2	cas			M	1	Chrtková & Bělohlávková in KČR 4
Lathyrus hirsutus	L.	Faba	neo 2	nat	1841		E M	111	Wimmer 1841, Paulič in Hadinec & Lustyk 2011, Pyšek et al. 2012b
Lathyrus laxiflorus	(Desf.) Kuntze	Faba	neo 3	cas	1962	1962	E As	1	Kilián & Krkavec 1963, Danihelka & Hlisnikovský 2021b, this study*
Lathyrus ochrus	(L.) DC.	Faba	neo 2	cas			M	1	Chrtková & Bělohlávková in KČR 4
Lathyrus odoratus	L.	Faba	neo 3	cas			M	7	Chrtková & Bělohlávková in KČR 4
Lathyrus sativus	L.	Faba	ar BR	cas			anec	31	Chrtková & Bělohlávková in KČR 4
Lathyrus sphaericus	Retz.	Faba	neo 4	cas	2008		M As Af	1	this study*
Lathyrus tingitanus	L.	Faba	neo 3	cas			M	1	Chrtková & Bělohlávková in KČR 4
Lathyrus tuberosus	L.	Faba	ar BR	nat			M	411	Chrtková & Bělohlávková in KČR 4
Lavandula angustifolia	Mill.	Lami	ar/neo	cas			M	19	Tomšovic in KČR 6
Lavatera punctata	All.	Malv	neo 4	cas	2016		M As	1	Vaníček in Lustyk & Doležal 2020, this study*
Lavatera trimestris	L.	Malv	neo 2	cas			M	4	Domin 1918
Lawrencia glomerata	Hook.	Malv	neo 2	cas	1961		Au	1	Dvořák & Kühn 1966, Slavík in KČR 3
Legousia hybrida	(L.) Delarbre	Camp	neo 2	cas	1809		E	1	Kovanda in KČR 6
Legousia pentagonia	(L.) Druce	Camp	neo 4	cas	2005		M	1	Řehořek & Lososová in Hadinec & Lustyk 2009
Legousia speculum-veneris	(L.) Chaix	Camp	neo 2	cas	1809		M	2	Kovanda in KČR 6
Lemna turionifera	Landolt	Arac	neo 3	nat	1992		AmN	95	Kaplan in Kaplan et al. 2016a
Lens culinaris	Medik.	Faba	ar NE	cas			anec	8	Chrtková in KČR 4
Leontopodium alpinum	Cass.	Aste	neo 2	cas	1888		E	4	Bělohlávková in KČR 7
Leonurus cardiaca nothosubsp. *intermedius*	Tzvelev	Lami	neo 2	nat	1887		hybrid	20	Holub 1993
Leonurus cardiaca subsp. *cardiaca*	L.	Lami	ar EM	nat			anec	62	Holub 1993, Tomšovic in KČR 6
Leonurus cardiaca subsp. *villosus*	(D'Urv.) Hyl.	Lami	neo 2	nat	1899		E M	23	Holub 1993
Leonurus japonicus	Houtt.	Lami	neo 2	cas	1934		As	1	Tomšovic in KČR 6, Kaplan et al. 2019a
Lepidium africanum	(Burm. f.) DC.	Bras	neo 3	cas	1964	1990	Af	3	Ducháček in Kaplan et al. 2018b
Lepidium campestre	(L.) W. T. Aiton	Bras	ar IR	nat			E M	508	Ducháček in Kaplan et al. 2018b
Lepidium coronopus	(L.) Al-Shehbaz	Bras	ar *	nat			M	170	Ducháček in Kaplan et al. 2018b
Lepidium densiflorum	Schrad.	Bras	neo 2	nat	1904		AmN	159	Ducháček in Kaplan et al. 2018b
Lepidium didymum	L.	Bras	neo 2	nat	1903		AmS	41	Ducháček in Kaplan et al. 2018b*
Lepidium draba	L.	Bras	ar LM	nat			M	428	Ducháček in Kaplan et al. 2018b
Lepidium heterophyllum	Benth.	Bras	neo 2	cas	1905		E	25	Ducháček in Kaplan et al. 2018b
Lepidium latifolium	L.	Bras	neo 2	cas	1878		E M	11	Ducháček in Kaplan et al. 2018b
Lepidium perfoliatum	L.	Bras	neo 2	cas	1866		E M	60	Ducháček in Kaplan et al. 2018b
Lepidium ruderale	L.	Bras	ar BR	nat			M	491	Ducháček in Kaplan et al. 2018b
Lepidium sativum	L.	Bras	ar/neo	cas	1808		M Af	62	Ducháček in Kaplan et al. 2018b
Lepidium virginicum	L.	Bras	neo 2	nat	1920		AmN AmC	92	Ducháček in Kaplan et al. 2018b
Leptochloa chinensis	(L.) Nees	Poac	neo 3	cas	1961	1961	As	1	Kaplan in Hadinec & Lustyk 2014

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Leptochloa decipiens subsp. *peacockii*	(Maiden et Betche) N. Snow	Poac	neo 3	cas	1959	1960	Au	1	Kaplan in Hadinec & Lustyk 2014, this study*
Leptochloa divaricatissima	S. T. Blake	Poac	neo 3	cas	1960	1960	Au	1	Kaplan in Hadinec & Lustyk 2014*
Leptochloa fusca subsp. *fascicularis*	(Lam.) N. Snow	Poac	neo 3	cas	1975	1991	AmN & C & S	2	Kaplan in Hadinec & Lustyk 2014
Leptochloa fusca subsp. *fusca*	(L.) Kunth	Poac	neo 3	cas	1963	1963	As Af Au	1	Kaplan in Hadinec & Lustyk 2014, this study*
Lepyrodiclis holosteoides	(C. A. Mey.) Fisch. et C. A. Mey.	Cary	neo 3	cas	1967	1967	M As	1	Dvořák in KČR 2
Leucanthemella serotina	(L.) Tzvelev	Aste	neo 3	cas	1973		E	1	Zelený in KČR 7, Hadinec & Lustyk 2012
Levisticum officinale	W. D. J. Koch	Apia	ar LM	cas			M	51	Tomšovic in KČR 5
Leymus arenarius	(L.) Hochst.	Poac	neo 3	cas			E	5	Dostál 1989, Kaplan et al. 2019a
Liatris spicata	(L.) Willd.	Aste	neo 4	cas	2018		AmN	3	Boublík et al. in Lustyk & Doležal 2020, this study*
Ligularia przewalskii	(Maxim.) Diels	Aste	neo 4	cas	2020		As	1	Řepka in Lustyk & Doležal 2021, this study*
Lilium bulbiferum var. *bulbiferum*	L.	Lili	ar/neo	nat			E	20	Pyšek et al. 2012b*
Lilium candidum	L.	Lili	ar/neo	cas			M	4	Hrouda in KČR 8
Limonium gmelinii	(Willd.) Kuntze	Plum	neo 4	cas	2009		E	4	Kocián et al. 2016, Danihelka & Kocián in Kaplan et al. 2018a, this study*
Linaria arvensis	(L.) Desf.	Plan	ar LM	cas		1998	M	161	Suda 1999, 2001, Grulich in KČR 6, Danihelka & Galušková in Kaplan et al. 2023
Linaria maroccana	Hook. f.	Plan	neo 2	cas	1852		M	7	Čelakovský 1871 as L. bipartita, Dostál et al. 1948–1950 as L. bipartita, Danihelka & Galušková in Kaplan et al. 2023
Linaria odora	(M. Bieb.) Fisch.	Plan	neo 3	cas	1963	1963	E As	2	Danihelka & Hlisnikovský 2021a, Danihelka & Galušková in Kaplan et al. 2023, this study*
Linaria pelisseriana	(L.) Mill.	Plan	neo 4	cas	2014		M	1	Kocián 2014, Danihelka & Galušková in Kaplan et al. 2023, this study*
Linaria purpurea	(L.) Mill.	Plan	neo 2	cas	1880		M	7	Dostál et al. 1948–1950, Janáková et al. in Lustyk & Doležal 2021, Danihelka & Galušková in Kaplan et al. 2023, this study*
Linaria repens	(L.) Mill.	Plan	neo 2	nat	1920		M	11	Dostál et al. 1948–1950, Grulich in KČR 6, Danihelka & Galušková in Kaplan et al. 2023
Linaria vulgaris	Mill.	Plan	ar EM	nat			M	643	Grulich in KČR 6, Danihelka & Galušková in Kaplan et al. 2023
Lindernia dubia	(L.) Pennell	Lind	neo 3	cas	1989		AmN	9	Kurka 1990, Šumberová et al. 2012, Šumberová et al. in Hadinec & Lustyk 2016, Šumberová & Ducháček in Kaplan et al. 2016b
Linum usitatissimum	L.	Lina	ar NE	cas			anec	151	Hrouda in KČR 5
Lobelia erinus	L.	Camp	neo 3	cas			Af	10	Slavík in KČR 6
Lobularia maritima	(L.) Desv.	Bras	neo 3	cas	1963		M	9	Smejkal in KČR 3
Lolium ×hybridum	Hausskn.	Poac	neo *	nat			anec	6	Kaplan et al. 2019a
Lolium multiflorum	Lam.	Poac	neo 2	nat	1883		E	461	Kaplan et al. 2019a
Lolium remotum	Schrank	Poac	ar BR	cas			M	16	Kaplan et al. 2019a
Lolium rigidum subsp. *lepturoides*	Sennen et Mauricio	Poac	neo 3	cas	1971	1971	M	1	Grüll 1979, Špryňar in KČR 9
Lolium rigidum subsp. *rigidum*	Gaudin	Poac	neo 3	cas		1961	M	2	Dvořák & Kühn 1966, Špryňar in KČR 9
Lolium temulentum	L.	Poac	ar NE	cas			M	28	Kaplan et al. 2019a
Lonicera caprifolium	L.	Capr	ar/neo	nat	1809		E M	113	Chrtek in KČR 5
Lonicera periclymenum	L.	Capr	ar/neo	nat	1994		E	55	Pyšek et al. 2012b
Lonicera tatarica	L.	Capr	neo 2	cas	1872		As	148	Chrtek in KČR 5
Lotus ornithopodioides	L.	Faba	neo 3	cas	1996		M	3	Pyšek et al. 2012b
Lunaria annua	L.	Bras	ar/neo	nat	1819		M	120	Dvořák in KČR 3
Lupinus albus	L.	Faba	neo 2	cas	1878		M	10	Tomšovic & Bělohlávková in KČR 4
Lupinus angustifolius	L.	Faba	neo 2	cas	1900		M	9	Tomšovic & Bělohlávková in KČR 4
Lupinus luteus	L.	Faba	neo 2	cas	1880		M	12	Tomšovic & Bělohlávková in KČR 4
Lupinus polyphyllus	Lindl.	Faba	neo 2	inv	1895		AmN	528	Tomšovic & Bělohlávková in KČR 4
Luzula nivea	(L.) DC.	Junc	neo 3	cas			E	1	Kaplan et al. 2019a
Lychnis chalcedonica	L.	Cary	neo 2	cas	1884		E As	64	Kaplan & Danihelka in Kaplan et al. 2022
Lychnis coronaria	(L.) Desr.	Cary	ar/neo	nat	1845		E M	116	Kaplan & Danihelka in Kaplan et al. 2022
Lycium barbarum	L.	Sola	neo 2	inv	1870		E M	242	Skalická in KČR 6
Lycium chinense	Mill.	Sola	neo 3	cas			As	5	Pyšek et al. 2002
Lycopsis arvensis	L.	Bora	ar LM	nat			E	321	Křísa in KČR 6

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Lycopsis orientalis	L.	Bora	neo 2	nat	1862		E M As	5	Krahulec 1981, Křísa in KČR 6, Hadinec in Hadinec & Lustyk 2009, Hadinec et al. 2022*
Lycopus europaeus subsp. *menthifolius*	(Mabille) Skalický	Lami	neo 2	cas	1880		M	1	Skalický 1968, Chrtek in KČR 6
Lysimachia ciliata	L.	Prim	neo 4	cas	2012		AmN	1	Uher 2014, this study*
Lysimachia punctata	L.	Prim	neo 2	nat	1819		E M	283	Skalický in KČR 3
Lythrum junceum	Banks et Sol.	Lyth	neo 3	cas	1965		M	1	Toman & Starý 1966, Dvořáková in KČR 5
Macleaya cordata	(Willd.) R. Br.	Papa	neo 3	cas			As	4	Kubát in KČR 1
Madia sativa	Molina	Aste	neo 3	cas	1965		AmC	3	Zelený in KČR 7
Mahonia aquifolium	(Pursh) Nutt.	Berb	neo 3	nat			AmN	161	Zelený in KČR 1
Malcolmia africana	(L.) W. T. Aiton	Bras	neo 2	cas	1935	1960	M	1	Krist 1940, Kilián & Krkavec 1963, Danihelka & Hlisnikovský 2021b
Malcolmia chia	(L.) DC.	Bras	neo 2	cas			M	1	Dvořák in KČR 3
Malcolmia maritima	(L.) W. T. Aiton	Bras	neo 2	cas	1850		M	1	Dvořák in KČR 3
Malope trifida	Cav.	Malv	neo 2	cas	1934		M	5	Krist 1935
Malus baccata	(L.) Borkh.	Rosa	neo 4	cas			As	6	Pyšek et al. 2012b
Malus ×dasyphylla	Borkh.	Rosa	ar *	nat			hybrid	16	Dostálek in KČR 3
Malus domestica	Borkh.	Rosa	ar EM	nat			anec	514	Dostálek in KČR 3
Malus fusca	(Raf.) C. K. Schneid.	Rosa	neo 4	cas	2004		AmN	1	Řehořek in Hadinec & Lustyk 2009
Malva ×adulterina	Wallr.	Malv	ar *	cas			hybrid	3	Slavík in KČR 3
Malva ×zoernigii	B. Fleisch.	Malv	ar *	cas			hybrid	1	Slavík in KČR 3
Malva neglecta	Wallr.	Malv	ar BR	nat			M	531	Slavík in KČR 3
Malva parviflora	L.	Malv	neo 3	cas	1957		M	1	Slavík in KČR 3
Malva pusilla	Sm.	Malv	ar IR	nat			E As	114	Slavík in KČR 3
Malva sylvestris var. *mauritiana*	(L.) Boiss.	Malv	ar/neo	cas			anec	26	Slavík in KČR 3
Malva sylvestris var. *sylvestris*	L.	Malv	ar ENE	nat			M	73	Slavík in KČR 3
Malva verticillata var. *crispa*	L.	Malv	neo 2	cas	1853		As	6	Slavík in KČR 3
Malva verticillata var. *verticillata*	L.	Malv	neo 2	cas			As	12	Slavík in KČR 3
Marrubium ×paniculatum	Desr.	Lami	ar *	cas			hybrid	1	Hrouda in KČR 6
Marrubium peregrinum	L.	Lami	ar *	nat			E M	38	Kaplan in Kaplan et al. 2020
Marrubium vulgare	L.	Lami	ar EM	cas			M	186	Kaplan in Kaplan et al. 2020
Matricaria discoidea	DC.	Aste	neo 2	nat	1853		As	618	Kubát in KČR 7
Matteuccia struthiopteris	(L.) Tod.	Onoc	neo 2	nat	1815		E AmN As	251	Ekrt in Kaplan et al. 2018b
Matthiola incana subsp. *incana*	(L.) W. T. Aiton	Bras	neo 1	cas	1877		M	1	Dvořák in KČR 3
Matthiola longipetala subsp. *bicornis*	(Sm.) P. W. Ball	Bras	neo 3	cas	1952		M	1	Dvořák in KČR 3
Matthiola longipetala subsp. *longipetala*	(Vent.) DC.	Bras	neo 2	cas	1924		E M	1	Dvořák in KČR 3
Meconopsis cambrica	(L.) Vig.	Papa	neo 3	cas	2000		E	3	Kubát in Härtel et al. 2002, Hadinec et al. 2003
Medicago arabica	(L.) Huds.	Faba	neo 2	cas	1936		M	2	Kirschner & Štěpánek in KČR 4
Medicago disciformis	DC.	Faba	neo 3	cas	1961	?1963	M	1	Kilián & Krkavec 1962, Kirschner & Štěpánek in KČR 4
Medicago orbicularis	(L.) Bartal.	Faba	neo 3	cas	1961	1961	M	1	Kilián & Krkavec 1962, Kirschner & Štěpánek in KČR 4
Medicago polymorpha	L.	Faba	neo 2	cas	1880		M	5	Kirschner & Štěpánek in KČR 4
Medicago rigidula	(L.) All.	Faba	neo 2	cas	1923		M	1	Kirschner & Štěpánek in KČR 4
Medicago sativa	L.	Faba	neo 1	nat	1819		anec	446	Kirschner & Štěpánek in KČR 4
Medicago ×varia	Martyn	Faba	neo *	nat			hybrid	243	Kirschner & Štěpánek in KČR 4
Megathyrsus bivonianus	(Brullo et al.) Verloove	Poac	neo 3	cas	1961		M	1	Dvořák & Kühn 1966
Melampyrum arvense	L.	Orob	ar IR	nat			M	288	Štech in KČR 6
Melampyrum barbatum subsp. *barbatum*	Willd.	Orob	neo 2	cas	1893		E	2	Štech in KČR 6
Melica altissima	L.	Poac	neo 3	nat	1955		E As	10	Kaplan et al. 2019a
Melilotus albus	Medik.	Faba	ar BR	nat			M As	560	Hašková et al. in KČR 4
Melilotus indicus	(L.) All.	Faba	neo 2	cas	1913		M As	1	Hašková et al. in KČR 4
Melilotus officinalis	(L.) Lam.	Faba	ar BR	nat			M As	524	Hašková et al. in KČR 4
Melilotus siculus	(Turra) Steud.	Faba	neo 2	cas	1929		M	1	Hašková et al. in KČR 4
Melilotus sulcatus	Desf.	Faba	neo 2	cas	1929		M	1	Hašková et al. in KČR 4
Melilotus wolgicus	Poir.	Faba	neo 3	cas	1963		E	1	Hašková et al. in KČR 4
Melissa officinalis subsp. *officinalis*	L.	Lami	ar/neo	nat	1872		M	60	Tomšovic in KČR 6
Mentha ×gracilis	Sole	Lami	ar/neo	cas	1855		anec	142	Štěpánek 1998b, Štěpánek in KČR 6
Mentha ×niliaca	Jacq.	Lami	ar/neo	nat	1976		hybrid	9	Štěpánek 1998b, Štěpánek in KČR 6
Mentha ×piperita nothosubsp. *piperita*	L.	Lami	ar/neo	cas	1840		anec	155	Štěpánek 1998b, Štěpánek in KČR 6
Mentha ×rotundifolia	(L.) Huds.	Lami	ar/neo	nat	1846		anec	298	Štěpánek 1998b, Štěpánek in KČR 6
Mentha spicata s.l.		Lami	ar/neo	cas	1844		anec	21	Štěpánek 1998a, Štěpánek in KČR 6

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Mentha spicata subsp. *spicata*	L.	Lami	ar/neo	cas	1818		E	57	Štěpánek 1998a, Štěpánek in KČR 6
Mercurialis annua	L.	Euph	ar BR	nat			M	184	Kubát in KČR 3
Mertensia sibirica	(L.) G. Don	Bora	neo 3	cas			As	1	Křísa in KČR 6
Mespilus germanica	L.	Rosa	ar LM	cas			M	13	Kovanda in KČR 3
Microrrhinum litorale	(Willd.) Speta	Plan	neo 3	nat	1994		M	14	Mikoláš 1997, Grulich in KČR 6*
Microrrhinum minus	(L.) Fourr.	Plan	ar EM	nat			E M	477	Grulich in KČR 6
Mimulus guttatus	DC.	Phry	neo 2	nat	1853		AmN	108	Slavík in KČR 6
Mimulus moschatus	Lindl.	Phry	neo 2	nat	1868		AmN	10	Slavík in KČR 6, Hadinec in Hadinec et al. 2002
Mimulus ringens	L.	Phry	neo 4	cas	2016		AmN	1	Hlisnikovský in Hadinec & Lustyk 2017, this study*
Mirabilis jalapa	L.	Nyct	neo 2	cas			AmN & C & S	3	Skalický in KČR 2
Mirabilis longiflora	L.	Nyct	neo 2	cas	1913	1913	AmN AmC	1	Domin 1917, this study*
Miscanthus ×giganteus	Hodk. et Renvoize	Poac	neo 4	cas	2003		hybrid	6	Tkáčiková 2019, Tkáčiková et al. in Lustyk & Doležal 2021, this study*
Miscanthus sacchariflorus	(Maxim.) Hack.	Poac	neo 4	cas	2003		As	5	Pyšek et al. 2012b, Řepka in Hadinec & Lustyk 2013
Miscanthus sinensis	Andersson	Poac	neo 4	cas			As	8	Kaplan et al. 2019a
Misopates orontium	(L.) Raf.	Plan	ar *	nat			M	249	Grulich in KČR 6, Danihelka in Hadinec et al. 2002*
Mollugo verticillata	L.	Moll	neo 4	cas	2020		AmN & C & S	1	Doležal in Lustyk & Doležal 2021, this study*
Monolepis nuttalliana	(Schult.) Greene	Amara	neo 2	cas	1927		AmN As	1	Dostálek et al. in KČR 2
Morus alba	L.	Mora	neo 1	cas	2012		As	66	Pyšek et al. 2012b
Muhlenbergia mexicana	(L.) Trin.	Poac	neo 4	cas	2021		AmN	1	Řepka et al. in Lustyk & Doležal 2022, this study*
Muscari armeniacum	Baker	Aspa	neo 4	nat	1951		E	87	Pyšek et al. 2012b, Uher in Hadinec & Lustyk 2016*
Muscari botryoides	(L.) Mill.	Aspa	ar/neo	cas			E	29	Hrouda in KČR 8
Muscari latifolium	J. Kirk	Aspa	neo 4	cas	2015		As	1	Uher in Hadinec & Lustyk 2016
Myagrum perfoliatum	L.	Bras	neo 2	cas	1855		M	1	Kirschner & Sutorý in KČR 3
Myriophyllum aquaticum	(Vell.) Verdc.	Halo	neo 4	cas	2018		AmC AmS	1	Koutecký & Müllerová in Lustyk & Doležal 2020, this study*
Myriophyllum heterophyllum	Michx.	Halo	neo 2	cas	1925	1925	AmN	1	Prančl in Hadinec & Lustyk 2015, this study*
Myrrhis odorata	(L.) Scop.	Apia	ar/neo	nat			E	88	Lhotská 1975, Slavík in KČR 5
Narcissus poëticus	L.	Amary	ar/neo	cas	1867		M	84	Bělohlávková in KČR 8
Narcissus pseudonarcissus	L.	Amary	ar/neo	cas	1867		M	89	Bělohlávková in KČR 8
Nassella tenuissima	(Trin.) Barkworth	Poac	neo 4	cas	2019		AmN	8	Řepka et al. in Lustyk & Doležal 2021, this study*
Nemophila menziesii	Hook. et Arn.	Bora	neo 3	cas			AmN	1	Kaplan et al. 2019a
Nepeta cataria	L.	Lami	ar EM	nat			E As	160	Štěpánek in KČR 6
Nepeta ×faasenii	Stearn	Lami	neo 3	nat			anec	1	Štěpánek in KČR 6
Nepeta grandiflora	M. Bieb.	Lami	neo 2	cas	1900		E	8	Holub 1991, Štěpánek in KČR 6
Nepeta racemosa	Lam.	Lami	neo 2	nat			E M	14	Štěpánek in KČR 6
Neslia paniculata subsp. *paniculata*	(L.) Desv.	Bras	ar BR	nat			M	436	Dvořáková in KČR 3
Nicandra physalodes	(L.) Gaertn.	Sola	neo 3	cas	1853		AmS	26	Tomšovic in KČR 6
Nicotiana alata	Link et Otto	Sola	neo 3	cas			AmS	2	Bělohlávková & Tomšovic in KČR 6
Nicotiana rustica	L.	Sola	neo 1	cas			anec	23	Čulíková 1995, Bělohlávková & Tomšovic in KČR 6
Nicotiana tabacum	L.	Sola	neo 1	cas	1891		anec	3	Bělohlávková & Tomšovic in KČR 6
Nigella arvensis	L.	Ranu	ar BR	nat			M	161	Chrtková in KČR 1*
Nigella damascena	L.	Ranu	neo 2	cas	1874		M	30	Chrtková in KČR 1
Nigella sativa	L.	Ranu	ar/neo	cas			M As	4	Chrtková in KČR 1
Noccaea kovatsii	(Heuff.) F. K. Mey.	Bras	neo 3	cas			E	1	Dvořáková in KČR 3
Nonea lutea	(Desr.) DC.	Bora	neo 2	nat	1911		As	4	Domin 1919
Nonea rosea	(M. Bieb.) Link	Bora	neo 2	cas	1872		E	1	Sutorý in KČR 6
Nymphaea cv. div.		Nymp	neo 4	cas			anec	52	this study*
Ocimum basilicum	L.	Lami	ar LM	cas			As	3	Tomšovic in KČR 6
Oenothera acutifolia	Rostański	Onag	neo 3	cas	1975		hybrid	1	Jehlík in KČR 5
Oenothera albipercurva	Hudziok	Onag	neo 2	cas	1899		hybrid	1	Jehlík in KČR 5
Oenothera ammophila	Focke	Onag	neo 2	cas	1848		hybrid	4	Jehlík in KČR 5
Oenothera biennis	L.	Onag	neo 2	nat	1831		E As	378	Jehlík & Rostański 1980, Jehlík in KČR 5
Oenothera canovirens	E. S. Steele	Onag	neo 3	cas	1953		AmN	9	Jehlík in KČR 5
Oenothera coronifera	Renner	Onag	neo 4	cas	2001		hybrid	1	Pyšek et al. 2002, Mihulka et al. 2003
Oenothera depressa	Greene	Onag	neo 2	nat	1936		AmN	19	Jehlík in KČR 5
Oenothera fallax	Renner	Onag	neo 3	nat	1961		hybrid	28	Roubal 1972, Jehlík in KČR 5

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Oenothera flava subsp. *taraxacoides*	(Wooton et Standl.) W. L. Wagner	Onag	neo 4	cas	2000		AmN	1	Chrtek & Skočdopolová 2001, Procházka in Hadinec et al. 2002
Oenothera glazioviana	Micheli	Onag	neo 2	nat	1890		AmN	165	Jehlík in KČR 5
Oenothera hoelscheri	Rostański	Onag	neo 3	cas	1975		hybrid	3	Pyšek 1973, Jehlík in KČR 5
Oenothera issleri	Rostański	Onag	neo 2	nat	1949		hybrid	13	Jehlík in KČR 5
Oenothera macrocarpa	Nutt.	Onag	neo 2	cas	1913		AmN	1	Jehlík in KČR 5
Oenothera moravica	V. Jehlík et Rostański	Onag	neo 3	cas	1985		hybrid	3	Jehlík in KČR 5
Oenothera oakesiana	(A. Gray) S. Watson et J. M. Coult.	Onag	neo 3	cas	1962		hybrid	1	Jehlík in KČR 5
Oenothera parviflora	L.	Onag	neo 2	cas	1914		AmN	13	Jehlík in KČR 5
Oenothera punctulata	Rostański et Gutte	Onag	neo 3	cas	1972		hybrid	1	Jehlík in KČR 5
Oenothera pycnocarpa	G. F. Atk. et Bartlett	Onag	neo 3	nat	1960		AmN	45	Jehlík in KČR 5
Oenothera rubricaulis	Kleb.	Onag	neo 2	nat	1914		hybrid	60	Roubal 1968, Jehlík in KČR 5
Oenothera stricta	Link	Onag	neo 2	cas	1825		AmS	1	Jehlík in KČR 5, Pyšek et al. 2002, Mihulka et al. 2003
Oenothera subterminalis	R. R. Gates	Onag	neo 3	cas	1967		AmN	1	Jehlík in KČR 5
Oenothera tetragona	Roth	Onag	neo 2	cas	1884		AmN	1	Jehlík in KČR 5
Oenothera victorinii	R. R. Gates et Catches.	Onag	neo 3	cas	1973		AmN	4	Jehlík in KČR 5
Omphalodes verna	Moench	Bora	neo 3	cas			E M	17	Sutorý in KČR 6
Onobrychis viciifolia	Scop.	Faba	neo 2	nat	1852		E M	301	Chrtková in KČR 4
Onopordum acanthium	L.	Aste	ar IR	nat			E M	291	Koutecký in Kaplan et al. 2021
Opuntia phaeacantha	Engelm.	Cact	neo 3	nat			AmN	9	Kaplan et al. 2019a
Opuntia polyacantha	Haw.	Cact	neo 4	cas			AmN	1	Hadinec & Kubát in Hadinec et al. 2004
Origanum majorana	L.	Lami	ar LM	cas			M	3	Tomšovic in KČR 6
Ornithogalum divergens (= *O. umbellatum* auct.)	Boreau	Aspa	ar/neo	nat			E M	24	Hroneš et al. in Lustyk & Doležal 2019*
Ornithogalum nutans	L.	Aspa	ar/neo	nat	1809		E M	18	Hrouda in KČR 8
Ornithopus compressus	L.	Faba	neo 2	cas	1929	1937	M	1	Kaplan in Kaplan et al. 2022
Ornithopus sativus subsp. *sativus*	Brot.	Faba	neo 2	cas	1885		M	67	Kaplan in Kaplan et al. 2022
Orobanche crenata	Forssk.	Orob	neo 2	cas	1896	1901	M	1	Domin 1919, Zázvorka in KČR 6
Orobanche gracilis	Sm.	Orob	neo 2	cas	1878		E M	3	Zázvorka in Kaplan et al. 2019b
Orobanche hederae	Duby	Orob	neo 2	nat	1945		E M	1	Zázvorka in KČR 6
Orobanche lucorum	F. W. Schultz	Orob	neo 2	cas			E	2	Zázvorka in KČR 6
Orobanche minor	Sm.	Orob	neo 2	nat	1876		E M	57	Zázvorka in Kaplan et al. 2019b*
Othocallis amoena	(L.) Trávn.	Aspa	neo 2	cas	1809		As	5	Trávníček in KČR 8
Othocallis siberica	(Haw.) Speta	Aspa	neo 2	nat	1867		E	99	Trávníček in KČR 8*
Oxalis corniculata	L.	Oxal	neo 1	inv	1850		M As Au	350	Dohnal & Danihelka in Kaplan et al. 2020*
Oxalis debilis	Kunth	Oxal	neo 3	cas	1967	1979	AmS	4	Holub & Holubičková 1980, Danihelka in Kaplan et al. 2020
Oxalis dillenii	Jacq.	Oxal	neo 2	inv	1876		AmN	104	Dohnal & Danihelka in Kaplan et al. 2020
Oxalis latifolia	Kunth	Oxal	neo 3	cas	1963		AmN & C & S	1	Jehlík 1995, 1998, Holub in KČR 5
Oxalis pes-caprae	L.	Oxal	neo 3	cas	1958	1961	Af	1	Dvořák & Kühn 1966, Danihelka in Kaplan et al. 2020
Oxalis stricta	L.	Oxal	neo 2	nat	1814		AmN	530	Dohnal & Danihelka in Kaplan et al. 2020
Oxybaphus nyctagineus	(Michx.) Sweet	Nyct	neo 2	nat	1843		AmN	8	Skalický in KČR 2, Jehlík 1998
Paeonia lactiflora	Pall.	Paeo	neo 2	cas	2011		As	8	Pyšek et al. 2012b
Paeonia officinalis	L.	Paeo	ar/neo	cas			M	30	Pyšek et al. 2002
Panicum capillare subsp. *barbipulvinatum*	(Nash) Tzvelev	Poac	neo 3	nat	1968		AmN	5	Jehlík 1998, Kaplan et al. 2019a*
Panicum capillare subsp. *capillare*	L.	Poac	neo 2	nat	1940		AmN	9	Jehlík 1998, Kaplan et al. 2019a
Panicum dichotomiflorum	Michx.	Poac	neo 3	cas	1970		AmN	2	Jehlík 1998, Kaplan et al. 2019a
Panicum miliaceum subsp. *agricola*	H. Scholz et Mikoláš	Poac	neo 3	nat	1975		As	9	Jehlík 1998, Kaplan et al. 2019a
Panicum miliaceum subsp. *miliaceum*	L.	Poac	ar BR	cas			As	9	Kaplan et al. 2019a
Panicum miliaceum subsp. *ruderale*	(Kitag.) Tzvelev	Poac	neo 2	cas	1823		As	4	Jehlík 1998, Kaplan et al. 2019a*
Panicum philadelphicum subsp. *gattingeri*	(Nash) Freckmann et Lelong	Poa	neo 3	cas	1975	1975	AmN	1	Jehlík & Scholz in Greuter & Raab-Straube 2009, this study*
Panicum schinzii	Hack.	Poac	neo 4	cas	2019		Af		Lepší & Lepší 2020, this study*
Panicum virgatum	L.	Poac	neo 4	cas	2012		AmN	3	Chytrý & Danihelka in Hadinec & Lustyk 2015, this study*

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Papaver argemone	L.	Papa	ar BR	nat			E M	361	Kubát in KČR 1
Papaver atlanticum	(Ball) Coss.	Papa	neo 4	cas	2001		M	3	Pyšek et al. 2002*
Papaver croceum	Ledeb.	Papa	neo 3	cas			As	2	Kubát in KČR 1
Papaver dubium	L.	Papa	ar IR	nat			M	277	Kubát in KČR 1
Papaver hybridum	L.	Papa	neo 2	cas	1865		E M	3	Kubát in KČR 1
Papaver lecoqii	Lamotte	Papa	ar *	nat			E	3	Kubát in KČR 1
Papaver pseudo-orientale	(Fedde) Medw.	Papa	neo 4	cas			M	3	Kubát in KČR 1
Papaver rhoeas	L.	Papa	ar NE	nat			M	509	Kubát in KČR 1
Papaver somniferum	L.	Papa	ar NE	cas			M	186	Kubát in KČR 1
Parapholis incurva	(L.) C. E. Hubb.	Poac	neo 3	cas	1961	1961	E M	2	Dvořák & Kühn 1966
Parentucellia viscosa	(L.) Caruel	Orob	neo 2	cas	1882		M	2	Hrouda in KČR 6
Parietaria judaica	L.	Urti	neo 3	cas			M	3	Chrtek in KČR 1
Parietaria officinalis	L.	Urti	ar/neo	nat			M	26	Chrtek in KČR 1
Parietaria pensylvanica	Willd.	Urti	neo 4	cas	2000		AmN	1	Kubát in KČR 2, Pyšek et al. 2002
Parthenocissus inserta	(A. Kern.) Fritsch	Vita	neo 2	inv	1900		AmN	259	Koblížek in KČR 5
Parthenocissus quinquefolia	(L.) Planch.	Vita	neo 3	nat			AmN	149	Koblížek in KČR 5
Parthenocissus tricuspidata	(Siebold et Zucc.) Planch.	Vita	neo 4	cas	2021		As	35	this study*
Pastinaca sativa subsp. *urens*	(Godr.) Čelak.	Apia	ar *	nat			M	75	Hrouda in KČR 5
Paulownia tomentosa	(Thunb.) Steud.	Paul	neo 3	cas	1989		As	5	Špryňar et al. 1997
Peltaria alliacea	Jacq.	Bras	neo *	cas	1993		E M	2	Mandák 1995, Kaplan et al. 2019a
Pennisetum alopecuroides	(L.) Spreng.	Poac	neo 4	cas	2002		As Au	1	Pyšek et al. 2012b
Pentaglottis sempervirens	(L.) L. W. Bailey	Bora	neo 3	cas	1989		E	1	Holub 1996, Zlámalík 1996, Křísa in KČR 6
Perovskia 'Blue Spire'		Lami	neo 4	cas	2019		anec	1	Kaplan in Lustyk & Doležal 2021, this study*
Persicaria capitata	(D. Don) H. Gross	Poly	neo 4	cas	2014		As	4	Doležal & Uher in Hadinec & Lustyk 2016, Danihelka & Šumberová in Kaplan et al. 2017a, this study*
Persicaria orientalis	(L.) Spach	Polgn	neo 2	cas	1860		As	16	Danihelka & Šumberová in Kaplan et al. 2017a
Persicaria pensylvanica	(L.) M. Gómez	Polgn	neo 3	nat	1968		As	5	Danihelka & Šumberová in Kaplan et al. 2017a*
Petasites japonicus subsp. *giganteus*	Kitam.	Aste	neo 2	cas			As	5	Štech in KČR 7
Petrorhagia dubia	(Raf.) G. López et Romo	Cary	neo 2	cas	1934	1934	M	1	Danihelka in Kaplan et al. 2021, this study*
Petrorhagia saxifraga	(L.) Link	Cary	neo 2	nat	1819		E As	47	Presl & Presl 1819, Danihelka in Kaplan et al. 2021*
Petroselinum crispum	(Mill.) Fuss	Apia	ar LM	cas			M	31	Tomšovic in KČR 5
Petunia ×atkinsiana	(Sweet) W. H. Baxter	Sola	neo 2	cas			anec	13	Bělohlávková in KČR 6
Peucedanum altissimum	(Mill.) Thell.	Apia	neo 3	cas	1957	1970	E	1	Kühn 1970
Peucedanum austriacum subsp. *austriacum*	(Jacq.) W. D. J. Koch	Apia	neo 4	cas	2006		E	1	Marek et al. 2015, this study*
Peucedanum austriacum subsp. *rablense*	(Wufen) Čelak.	Apia	neo 2	cas	1837		E	1	Čelakovský 1875, Marek et al. 2015*
Peucedanum ostruthium	(L.) W. D. J. Koch	Apia	ar/neo	nat	1809		E	77	Kopecký 1973, Grulich in KČR 5
Phacelia campanularia	A. Gray	Bora	neo 3	cas			AmN	1	Křísa in KČR 6
Phacelia ciliata	Benth.	Bora	neo 3	cas			AmN	1	Křísa in KČR 6
Phacelia congesta	Hook.	Bora	neo 4	cas	2020		AmN	1	Sutorý in Lustyk & Doležal 2021, this study*
Phacelia tanacetifolia	Benth.	Bora	neo 2	cas	1891		AmN	169	Křísa in KČR 6
Phalaris arundinacea 'Picta'		Poac	neo 2	nat			anec	657	Kaplan et al. 2019a*
Phalaris brachystachys	Link	Poac	neo 2	cas	1915	1965	M	1	Dvořák & Kühn 1966, Štěpánková in KČR 9
Phalaris canariensis	L.	Poac	neo 2	cas	1844		M	59	Štěpánková in KČR 9
Phalaris coerulescens	Desf.	Poac	neo 2	cas	1929	1929	M	1	Štěpánková in KČR 9
Phalaris minor	Retz.	Poac	neo 3	cas	1961	1965	M Af	1	Dvořák & Kühn 1966
Phalaris paradoxa	L.	Poac	neo 2	cas	1926	1963	M	2	Dvořák & Kühn 1966, Štěpánková in KČR 9
Phaseolus coccineus	L.	Faba	neo 1	cas			AmN	7	Chrtková in KČR 4
Phaseolus vulgaris	L.	Faba	neo 1	cas			AmC AmS	10	Chrtková in KČR 4
Phelipanche nana	(Reuter) Soják	Orob	neo 3	cas	1985		M	1	Zázvorka in KČR 6
Phelipanche ramosa	(L.) Pomel	Orob	ar/neo	cas		1990	M	41	Jehlík 1998, Zázvorka in KČR 6
Philadelphus coronarius	L.	Hydrn	neo 2	cas	1819		M	193	Bělohlávková in KČR 3
Phleum exaratum	Griseb.	Poac	neo 4	cas	2003		M As	1	Ducháček & Chrtek 2017, Chrtek & Ducháček in Kaplan et al. 2018a, this study*
Phleum paniculatum	Huds.	Poac	neo 2	cas	1814	1882	M	6	Chrtek & Ducháček in Kaplan et al. 2018a

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Phleum subulatum	(Savi) Asch. et Graebn.	Poac	neo 2	cas	1926	1926	M	1	Chrtek & Ducháček in Kaplan et al. 2018a
Phlomis russeliana	(Sims) Benth.	Lami	neo 4	cas	2014		As	1	Uher in Hadinec & Lustyk 2017, this study*
Phlox drummondii	Hook.	Pole	neo 2	cas	1913		AmN	1	Domin 1919
Phlox paniculata	L.	Pole	neo 2	cas	1880		AmN	40	Křísa in KČR 6
Phlox subulata	L.	Pole	neo 2	cas			AmN	10	Křísa in KČR 6
Physalis alkekengi var. *alkekengi*	L.	Sola	ar NE	nat			M	1	Hendrych 1989, Slavík in KČR 6
Physalis alkekengi var. *franchetii*	(Mast.) Makino	Sola	neo *	cas			anec	6	Slavík in KČR 6
Physalis angulata	L.	Sola	neo 3	cas	1972		AmN & C & S	1	Slavík in KČR 6
Physalis peruviana	L.	Sola	neo 3	cas			AmS	11	Slavík in KČR 6
Physalis philadelphica	Lam.	Sola	neo 2	cas	1935		AmC	6	Krist 1935, Pyšek 1995
Physalis pubescens	L.	Sola	neo 4	cas	2001		AmN & C & S	1	Pyšek et al. 2002, Lepší 2005
Physocarpus opulifolius	(L.) Maxim.	Rosa	neo 2	nat	1874		AmN	180	Koblížek in KČR 3
Phytolacca acinosa	Roxb.	Phyt	neo 3	nat	1956		As	47	Skalický 1972, Skalický in KČR 2
Phytolacca americana	L.	Phyt	neo 1	cas	1906		AmN	9	Domin 1917
Pimpinella anisum	L.	Apia	ar LM	cas			M	4	Štěpánek in KČR 5
Pimpinella peregrina	L.	Apia	neo 4	cas	2011		M	1	Nepraš et al. 2011, Nepraš in Hadinec & Lustyk 2012
Pinguicula crystallina subsp. *hirtiflora*	(Ten.) Strid	Lent	neo 4	cas	2006		M	2	Pyšek et al. 2012b
Pinguicula grandiflora subsp. *grandiflora*	Lam.	Lent	neo 4	cas	1985		E	1	Nepraš 2017, this study*
Pinguicula grandiflora subsp. *grandiflora* × *P. vulgaris* subsp. *vulgaris*		Lent	neo 4	cas	2009		hybrid	1	Štěpán 2014, this study*
Pinus nigra subsp. *nigra*	J. F. Arnold	Pina	neo 2	nat			E	401	Velebil in Kaplan et al. 2023
Pinus strobus	L.	Pina	neo 2	inv	1800		AmN	402	Hadincová et al. 1997, Velebil in Kaplan et al. 2023
Pistia stratiotes	L.	Arac	neo 3	cas	1999		AmS Af	16	Kaplan in Kaplan et al. 2016a
Pisum sativum	L.	Faba	ar NE	cas			anec	63	Chrtková in KČR 4
Plantago afra	L.	Plan	neo 2	cas	1851		M	1	Chrtek in KČR 6
Plantago alpina	L.	Plan	neo 2	cas	1934	1948	E	1	Chrtek & Skočdopolová 1995, Danihelka & Kaplan in Kaplan et al. 2018b
Plantago coronopus subsp. *coronopus*	L.	Plan	neo 2	nat	1934		M	67	Krist 1935, Danihelka et al. in Kaplan et al. 2018b*
Platanus ×hispanica	Münchh.	Plat	neo 1	cas			anec	41	Pyšek et al. 2002
Platycladus orientalis	(L.) Franco	Cupr	neo 3	cas	1950		As	28	Skalická in KČR 1
Pleioblastus chino	(Franch. et Sav.) Makino	Poac	neo 4	cas	2007		As	3	Řepka in Hadinec & Lustyk 2014, this study*
Podophyllum hexandrum	Royle	Berb	neo 4	cas	2009		As	1	Pyšek et al. 2012b
Polanisia uniglandulosa	(Cav.) DC.	Cleo	neo 2	cas	1931	1931	AmN	1	Uher & Hadinec in Hadinec & Lustyk 2016, this study*
Polycarpon tetraphyllum	(L.) L.	Cary	neo 2	cas	1863		E M	1	Sádlo in Lustyk & Doležal 2021
Polycnemum arvense	L.	Amara	ar ENE	cas			E M As	134	Tomšovic in KČR 2, Lysák in Hadinec et al. 2003
Polycnemum heuffelii	Láng	Amara	ar *	cas			M	1	Tomšovic in KČR 2
Polycnemum majus	A. Braun	Amara	ar BR	nat			E M	68	Tomšovic in KČR 2, Novák 2001
Polygonatum latifolium	(Mill.) Desf.	Aspa	neo 2	cas	1809		E	17	Šída in KČR 8
Polypogon fugax	Steud.	Poac	neo 3	cas	1964	1964	M	1	Zázvorka in Kaplan et al. 2015
Polypogon monspeliensis	(L.) Desf.	Poac	neo 2	cas	1896	1967	M	10	Zázvorka in Kaplan et al. 2015
Polypogon viridis	(Gouan) Breistr.	Poac	neo 4	cas	2020		M As	1	Řepka in Lustyk & Doležal 2021, this study*
Pontederia cordata	L.	Pont	neo 4	cas	2004		AmN & C & S	9	Kaplan in Kaplan et al. 2016a
Populus balsamifera	L.	Sali	neo 2	nat	1880		AmN	56	Pyšek et al. 2002
Populus ×canadensis	Moench	Sali	neo 2	inv			hybrid	465	Koblížek in KČR 2, Kaplan et al. 2019a
Portulaca grandiflora	Hook.	Port	neo 2	cas	1937		AmS	21	Domin 1937, Skalický & Sutorý in KČR 2, Petřík 2001
Portulaca oleracea subsp. *oleracea*	L.	Port	ar EM	inv			M	62	Ducháček in Kaplan et al. 2017b
Potentilla adscharica	R. Keller	Rosa	neo 2	cas	1947	1956	E	2	Soják 2007
Potentilla intermedia	L.	Rosa	neo 2	nat	1903		E	32	Soják in KČR 4
Potentilla pensylvanica	L.	Rosa	neo 4	cas	2021		E AmN As	1	this study*
Potentilla radiata	Lehm.	Rosa	neo 2	cas	1920	1926	E M	1	Soják 2007

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Potentilla supina subsp. *paradoxa*	(Nutt.) Soják	Rosa	neo 2	cas	1921		AmN As	7	Soják in KČR 4
Primula japonica	A. Gray	Prim	neo 2	cas	1900		As	3	Lustyk in Hadinec & Lustyk 2014, this study*
Primula rosea	Royle	Prim	neo 4	cas	2005		As	1	Kočí in Hadinec et al. 2005
Primula vulgaris subsp. *vulgaris*	Huds.	Prim	ar/neo	nat			E M	24	Kovanda in KČR 3
Proboscidea fragrans	(Lindl.) Decne.	Mart	neo 4	cas	2019		AmN	1	Uher in Lustyk & Doležal 2020, this study*
Prunus armeniaca	L.	Rosa	ar/neo	cas			As	44	Chrtek in KČR 3
Prunus cerasifera	Ehrh.	Rosa	ar LM	inv			M	278	Chrtek in KČR 3
Prunus cerasus	L.	Rosa	ar EM	nat			anec	313	Chrtek in KČR 3
Prunus domestica	L.	Rosa	ar LM	nat			anec	467	Chrtek in KČR 3
Prunus ×eminens	Beck	Rosa	ar EM	nat			hybrid	39	Chrtek in KČR 3
Prunus insititia	L.	Rosa	ar EM	nat			M	250	Chrtek in KČR 3
Prunus laurocerasus	L.	Rosa	neo 4	cas	2001		M	12	Pyšek et al. 2002
Prunus persica	(L.) Batsch	Rosa	ar EM	cas			As	33	Chrtek in KČR 3
Prunus serotina	Ehrh.	Rosa	neo 3	inv			AmN	83	Chrtek in KČR 3
Prunus spinosa subsp. *fruticans*	(Weihe) Nyman	Rosa	ar/neo	nat			hybrid	9	Chrtek in KČR 3*
Prunus tomentosa	Thunb.	Rosa	neo 4	cas	2018		As	1	Samková & Doležal in Lustyk & Doležal 2019, this study*
Prunus virginiana	L.	Rosa	neo 3	cas			AmN	5	Pyšek et al. 2002
Psephellus dealbatus	(Willd.) K. Koch	Aste	neo 3	nat	1961		E	33	Koutecký in Kaplan et al. 2018b
Pseudofumaria alba subsp. *alba*	(Mill.) Lidén	Papa	neo 3	nat	1978		M	19	Kolbek et al. 2007, Prančl in Kaplan et al. 2022
Pseudofumaria lutea	(L.) Borkh.	Papa	neo 2	nat			M	205	Prančl in Kaplan et al. 2022
×Pseudomatricaria rohlenae	Domin	Aste	ar *	cas			hybrid	1	Rohlena 1930, Kubát in KČR 7
Pseudotsuga menziesii var. *glauca*	(Mayr) Franco	Pina	neo 4	cas	2016		AmN	12	Lepší & Lepší in Lustyk & Doležal 2018, this study*
Pseudotsuga menziesii var. *menziesii*	(Mirb.) Franco	Pina	neo 2	nat			AmN	420	Skalická in KČR 1*
Ptelea trifoliata	L.	Ruta	neo 3	cas	1961		AmN	14	Opravil 1961, Skalická & Svoboda 1971
Pteris cretica	L.	Pter	neo 4	cas	2016		M As Af	1	Novák 2018, Ekrt in Kaplan et al. 2020, this study*
Pteris multifida	Poir.	Pter	neo 3	cas	1998	1998	As	1	Ekrt in Hadinec & Lustyk 2011, Ekrt in Kaplan et al. 2020
Puccinellia gigantea	(Grossh.) Grossh.	Poac	neo 3	cas	1962	1963	M	1	Kilián & Krkavec 1963, Danihelka & Hlisnikovský 2021b
Puccinellia stricta	(Hook. f.) Blom	Poac	neo 3	cas	1961	1961	Au	1	Dvořák & Kühn 1966
Pulmonaria rubra	Schott	Bora	neo 4	cas	2011		E	2	Hadinec & Rydlo in Hadinec et al. 2004
Pulsatilla slavica	G. Reuss	Ranu	neo 2	cas			E	3	Skalický in KČR 1, Šuk 2001
Pulsatilla vulgaris	Mill.	Ranu	neo 2	cas	1852		E	11	Skalický in KČR 1
Puschkinia scilloides	Adams	Aspa	neo 2	cas	1856		M	5	Bělohlávková in KČR 8
Pyracantha coccinea	M. J. Roem.	Rosa	neo 4	nat	2002		E As	31	Pyšek et al. 2012b
Pyrus ×amphigenea	Dostálek	Rosa	ar/neo	nat			hybrid	6	Dostálek in KČR 3
Pyrus communis	L.	Rosa	ar EM	nat			anec	491	Dostálek in KČR 3
Pyrus nivalis	Jacq.	Rosa	ar/neo	cas			E As	15	Dostálek in KČR 3
Quercus frainetto	Ten.	Faga	neo 3	cas	1898		M As	31	Novák & Roleček 2013, Jelínek & Úradníček in Kaplan et al. 2022, this study*
Quercus rubra	L.	Faga	neo 2	inv			AmN	547	Jelínek & Úradníček in Kaplan et al. 2022
Ranunculus acris subsp. *friesianus*	(Jord.) Syme	Ranu	neo 2	nat	1882		E	23	Křísa in KČR 1
Ranunculus arvensis	L.	Ranu	ar EM	nat			E M As	289	Křísa in KČR 1
Raphanus raphanistrum	L.	Bras	ar ENE	nat			M	517	Zelený in KČR 3
Raphanus sativus	L.	Bras	ar/neo	cas			anec	32	Zelený in KČR 3
Rapistrum rugosum subsp. *orientale*	(L.) Arcang.	Bras	neo 2	cas	1940		M	2	Smejkal in KČR 3
Rapistrum rugosum subsp. *rugosum*	(L.) All.	Bras	neo *	cas			M	1	Hejný et al. 1973, Smejkal in KČR 3
Reseda alba subsp. *alba*	L.	Rese	neo 2	cas	1840		M	1	Kubát & Šourková in KČR 3
Reseda lutea	L.	Rese	ar BR	nat			M	333	Kubát & Šourková in KČR 3
Reseda luteola	L.	Rese	ar EM	nat			M	106	Kubát & Šourková in KČR 3
Reseda odorata	L.	Rese	neo 2	cas	1900		anec	6	Kubát & Šourková in KČR 3
Reseda phyteuma	L.	Rese	ar *	cas			M	11	Hendrych 1978, Roubal 1984, Kubát & Šourková in KČR 3, Štefánek in Hadinec & Lustyk 2006
Reynoutria ×bohemica	Chrtek et Chrtková	Polgn	neo 2	inv	1942		hybrid	212	Chrtek in KČR 2, Mandák et al. 2004
Reynoutria japonica var. *compacta*	(Hook. f.) Moldenke	Polgn	neo 3	cas	1995		As	1	Hlaváček et al. 1996, Mandák & Pyšek 1997

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Reynoutria japonica var. *japonica*	Houtt.	Polgn	neo 2	inv	1892		As	54	Chrtek in KČR 2, Mandák et al. 2004
Reynoutria sachalinensis	(F. Schmidt) Nakai	Polgn	neo 2	inv	1869		As	285	Chrtek in KČR 2, Mandák et al. 2004
Rhagadiolus stellatus	(L.) Gaertn.	Aste	neo 2	cas	1929		M	1	Štech in KČR 7
Rhaponticum carthamoides	(Willd.) Iljin	Aste	neo 3	cas	1991		As	3	Řehořek in Hadinec et al. 2004
Rhaponticum repens	(L.) Hidalgo	Aste	neo 2	cas	1945		M	3	Hejný et al. 1973, Jehlík 1998, Skalická in KČR 7
Rheum officinale	Baill.	Polgn	neo *	cas			As	6	Lepší et al. 2006, Šída in Hadinec & Lustyk 2008
Rheum rhabarbarum	L.	Polgn	neo 1	cas	1967		As	8	Chrtek in KČR 2
Rhodanthe manglesii	Lindl.	Aste	neo 2	cas	1900	1900	Au	1	Domin 1918, Štech in KČR 7
Rhodotypos scandens	(Thunb.) Makino	Rosa	neo 3	nat	1990		As	6	Pyšek et al. 2012b
Rhus typhina	L.	Anac	neo 2	nat	1900		AmN	200	Skalická in KČR 5
Ribes aureum	Pursh	Gros	neo 2	cas	1900		AmN	52	Kirschner in KČR 3
Ribes odoratum	H. L. Wendl.	Gros	neo 2	cas			AmN	15	Kirschner in KČR 3
Ribes rubrum	L.	Gros	neo 1	nat	1809		E As	390	Kirschner in KČR 3
Ribes sanguineum	Pursh	Gros	neo 4	cas	2008		AmN	11	Hadinec & Prach in Hadinec & Lustyk 2008
Ribes spicatum	Robson	Gros	neo 2	cas	1885		E As	8	Kirschner in KČR 3
Ricinus communis	L.	Euph	neo 3	cas	1996		Af	7	Pyšek et al. 2002
Robinia pseudoacacia	L.	Faba	neo 2	inv	1874		AmN	553	Chrtková in KČR 4
Rodgersia pinnata	Franch.	Saxi	neo 4	cas	2001		As	2	Pyšek et al. 2002, Král et al. 2004c
Rodgersia podophylla	A. Gray	Saxi	neo 4	cas	2012		As	5	Pyšek et al. 2012b, Szokala et al. in Lustyk & Doležal 2019
Rosa ×alba	L.	Rosa	ar/neo	cas	1874		anec	6	Větvička in KČR 4
Rosa ×centifolia	L.	Rosa	ar/neo	cas			anec	10	Větvička in KČR 4
Rosa foetida	Herrm.	Rosa	neo 2	cas	1814		anec	3	Větvička in KČR 4
Rosa ×francofurtana	Münchh.	Rosa	neo 4	cas	2012		hybrid	1	Grulich in Lustyk & Doležal 2020, this study*
Rosa glauca	Pourr.	Rosa	neo 2	cas	1874		E	42	Větvička in KČR 4
Rosa multiflora	Thunb.	Rosa	neo 3	cas			As	28	Tichá 2004
Rosa rugosa	Thunb.	Rosa	neo 3	cas	1950		As	130	Větvička in KČR 4
Rosa villosa	L.	Rosa	ar/neo	nat			E	24	Řepka & Maděra in Kaplan et al. 2023
Rostraria cristata	(L.) Tzvelev	Poac	neo 2	cas	1927		M	3	Kaplan et al. 2019a
Rubia tinctorum	L.	Rubi	neo 1	cas	1800		M	8	Kubát in KČR 6
Rubrivena polystachya	(Meisn.) M. Král	Polgn	neo 2	nat	1967		As	36	Danihelka & Šumberová in Kaplan et al. 2017a
Rubus allegheniensis	Porter	Rosa	neo 2	cas			AmN	47	Holub in KČR 4
Rubus armeniacus	Focke	Rosa	neo 3	nat			E	65	Holub in KČR 4
Rubus canadensis	L.	Rosa	neo 3	cas			AmN	17	Holub in KČR 4, Holub 1999, Žíla & Chán 2001, Hadinec in Hadinec et al. 2002
Rubus illecebrosus	Focke	Rosa	neo 3	cas			As	2	Holub in KČR 4
Rubus laciniatus	Willd.	Rosa	neo 3	nat			anec	47	Holub in KČR 4
Rubus moschus	Juz.	Rosa	neo 3	cas			E	1	Holub in KČR 4
Rubus occidentalis	L.	Rosa	neo 3	cas	1997		AmN	13	Holub in KČR 4
Rubus odoratus	L.	Rosa	neo 3	nat	1880		AmN	39	Holub in KČR 4, Hadinec in Hadinec et al. 2003
Rubus parviflorus	Nutt.	Rosa	neo 3	nat			AmN	3	Holub in KČR 4
Rubus phoenicolasius	Maxim.	Rosa	neo 3	cas			As	6	Holub in KČR 4
Rubus silvaticus	Weihe et Nees	Rosa	neo 3	cas			E	5	Holub in KČR 4
Rubus tuberculatus	Bab.	Rosa	neo 3	cas			E	1	Holub in KČR 4
Rubus ulmifolius	Schott	Rosa	neo 3	cas			E	2	Holub in KČR 4
Rubus xanthocarpus	Bureau et Franch.	Rosa	neo 3	nat	1962		As	4	Holub & Palek 1981, Holub in KČR 4
Rudbeckia fulgida	Aiton	Aste	neo 3	cas	1989		AmN	1	Deyl & Skočdopolová-Deylová 1989
Rudbeckia hirta	L.	Aste	neo 2	cas	1873		AmN	76	Bělohlávková in KČR 7
Rudbeckia laciniata	L.	Aste	neo 2	inv	1859		AmN	245	Bělohlávková in KČR 7
Rumex acetosa × *R. thyrsiflorus*		Polgn	neo 2	cas			hybrid	1	Kubát in KČR 2
Rumex alpinus	L.	Polgn	neo 1	inv	1819		E	32	Kubát in KČR 2, Hendrych 2001
Rumex brownii	Campd.	Polgn	neo 3	cas	1965		Au	1	Kubát in KČR 2
Rumex ×corconticus	Kubát	Polgn	neo 3	cas	1981		hybrid	1	Kubát 1985, Kubát in KČR 2
Rumex confertus	Willd.	Polgn	neo 3	cas	1965		E As	3	Jehlík & Kopecký 1967, Kubát in KČR 2
Rumex dentatus subsp. *halacsyi*	(Rech.) Rech. f.	Polgn	neo 3	cas	1965		M As Af	1	Kubát in KČR 2
Rumex ×hybridus	Kindb.	Polgn	neo 3	cas	1981		hybrid	3	Kubát 1985, Kubát in KČR 2
Rumex longifolius	DC.	Polgn	neo 2	nat	1903		E	35	Domin 1917*
Rumex ×mezei	Hausskn.	Polgn	neo 3	cas	1980		hybrid	1	Kubát 1985, Kubát in KČR 2
Rumex obovatus	Danser	Polgn	neo 3	cas			AmS	18	Kubát in KČR 2
Rumex patientia × *R. tianschanicus* 'Uteuša'		Polgn	neo 4	cas	2005		anec	3	Pyšek et al. 2012b

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Rumex patientia subsp. *patientia*	L.	Polgn	neo 2	nat	1861		E M	47	Kubát in KČR 2, Grüll 1994, Jehlík 1998
Rumex ×propinquus	Aresch.	Polgn	neo 3	cas	1984		hybrid	1	Kubát 1985, Kubát in KČR 2
Rumex scutatus	L.	Polgn	neo 1	cas	1818		E	16	Kubát in KČR 2
Rumex thyrsiflorus	Fingerh.	Polgn	neo 2	nat			E As	225	Kubát in KČR 2
Rumex triangulivalvis	(Danser) Rech. f.	Polgn	neo 2	cas	1943		AmN	9	Hejný 1949, Hejný et al. 1973, Kubát in KČR 2, Jehlík 1998*
Ruta graveolens	L.	Ruta	ar/neo	cas			M	9	Kovanda in KČR 5
Sagittaria latifolia	Willd.	Alis	neo 2	nat	1945		AmN	52	Sutorý 2006, Hroudová in Kaplan et al. 2017a
Salix acutifolia	Willd.	Sali	neo *	cas			E As	6	Chmelař & Koblížek in KČR 2
Salix cordata	Michx.	Sali	neo 4	cas			AmN	1	Pyšek et al. 2012b
Salix matsudana 'Tortuosa'		Sali	neo 4	cas			anec	22	this study*
Salix melanopsis	Nutt.	Sali	neo 3	nat	1988		AmN	1	Úradníček 2004
Salix ×sepulcralis	Simonk.	Sali	neo 4	cas	2001		anec	58	Pyšek et al. 2002
Salsola collina	Pall.	Amara	neo 3	cas			E As	2	Tomšovic in KČR 2
Salvia hispanica	L.	Lami	neo 4	cas	2013		AmC AmS	15	Sádlo & Marek in Lustyk & Doležal 2018, Štěpánková in Kaplan et al. 2018b, this study*
Salvia officinalis	L.	Lami	ar LM	cas			M	44	Štěpánková in KČR 6
Salvia reflexa	Hornem.	Lami	neo 2	cas	1934	1972	AmN	2	Krist 1935, Štěpánková in Kaplan et al. 2018b
Salvia sclarea	L.	Lami	neo 2	cas	1880		M	9	Štěpánková in Kaplan et al. 2018b
Salvia spinosa	L.	Lami	neo 3	cas	1966	1966	M	1	Štěpánková 1999, Štěpánková in Kaplan et al. 2018b
Salvia verbenaca	L.	Lami	neo 3	cas	1965	1976	E M	2	Štěpánková in Kaplan et al. 2018b
Salvia viridis	L.	Lami	neo 2	cas	1908		M	1	Štěpánková in KČR 6
Sambucus ebulus	L.	Adox	ar NE	nat			E M	322	Chrtek in KČR 5
Sanguisorba minor subsp. *balearica*	(Nyman) Muńoz Garm. et C. Navarro	Rosa	neo 2	nat	1840		M	15	Holub 1978b, Skalický in KČR 4
Sanguisorba tenuifolia	Link	Rosa	neo 2	cas	1946		As	1	Skalický in KČR 4
Santolina chamaecyparissus	L.	Aste	neo 4	cas			M	1	Bělohlávková in KČR 7
Saponaria ocymoides	L.	Cary	neo 2	cas	1906		M	9	Domin 1924, Michal 1949, Šourková in KČR 2
Saponaria officinalis	L.	Cary	ar EM	nat			E M	471	Šourková in KČR 2
Sarracenia purpurea	L.	Sarr	neo 4	cas	2010		AmN	5	Pyšek et al. 2012b
Sasa palmata 'Nebulosa'		Poac	neo 4	cas	2012		anec	1	Pyšek et al. 2012b*
Satureja hortensis	L.	Lami	ar EM	cas			M	27	Tomšovic in KČR 6
Saxifraga cuneifolia	L.	Saxi	neo *	cas			E	1	Hrouda & Šourková in KČR 3
Saxifraga cymbalaria	L.	Saxi	neo 3	cas	1955		M	11	Procházka et al. 1983, Dostál 1989
Saxifraga ×geum	L.	Saxi	neo *	cas			hybrid	2	Hrouda & Šourková in KČR 3
Saxifraga hostii subsp. *hostii*	Tausch	Saxi	neo 2	nat	1850		E	1	Hrouda & Šourková in KČR 3
Saxifraga hypnoides	L.	Saxi	neo 2	cas	1819		E	1	Hrouda & Šourková in KČR 3
Saxifraga rotundifolia	L.	Saxi	neo 3	cas	1956		E M	1	Hrouda & Šourková in KČR 3
Scandix pecten-veneris	L.	Apia	ar *	cas			M	23	Chrtek et al. 1968, Křísa in KČR 5, Hadinec et al. 2003
Schismus barbatus	(L.) Thell.	Poac	neo 3	cas	1961	1961	M	2	Dvořák & Kühn 1966
Schkuhria pinnata	(Lam.) Thell.	Aste	neo 2	cas	1934		AmC AmS	2	Krist 1935
Scilla forbesii	(Baker) Speta	Aspa	neo 2	cas	1934		M	14	Trávníček 2010, Trávníček in KČR 8
Scilla luciliae	(Boiss.) Speta	Aspa	neo 3	cas			M	12	Trávníček in KČR 8
Scilla sardensis	(Barr et Sugden) Speta	Aspa	neo 3	cas	1965		M	6	Král et al. 2004a, Trávníček 2010, Trávníček in KČR 8
Scleroblitum atriplicinum	(F. Muell.) Ulbr.	Amara	neo 3	cas	1963		Au	1	Tomšovic in KČR 2
Sclerochloa dura	(L.) P. Beauv.	Poac	ar *	nat			M	124	Zázvorka in Kaplan et al. 2015
Sclerolaena tricuspis	(F. Muell.) Ulbr.	Amara	neo 3	cas	1961		Au	1	Dvořák & Kühn 1966, Tomšovic in KČR 2
Scolymus maculatus	L.	Aste	neo 3	cas	1969		M	1	Pyšek et al. 2012b, Danihelka in Hadinec & Lustyk 2013
Scoparia dulcis	L.	Plan	neo 4	cas			AmN & C & S	1	Řepka in Lustyk & Doležal 2019, this study*
Scopolia carniolica	Jacq.	Sola	neo 2	nat	1866		E	4	Čelakovský 1881, Pyšek et al. 2002, Hadinec in Hadinec & Lustyk 2008
Scorpiurus muricatus	L.	Faba	neo *	cas			M	1	Chrtková in KČR 4
Scrophularia canina	L.	Scro	neo 3	cas	1961	1976	E M	2	Kilián & Krkavec 1962, Dvořáková in KČR 6
Scrophularia chrysantha	Jaub. et Spach	Scro	neo 2	cas	1855		E M	5	Chrtek & Skočdopolová 1996, Hadinec in Hadinec & Lustyk 2015
Scutellaria altissima	L.	Lami	neo 2	nat	1901		E	17	Chrtek in KČR 6
Secale cereale	L.	Poac	ar BR	cas			anec	195	Kaplan et al. 2019a

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Sedobassia sedoides	(Schrad.) Freitag et G. Kadereit	Amara	neo 3	cas	1960		E M As	1	Kilián & Krkavec 1961
Sedum aizoon	L.	Cras	neo 2	cas	1880		As	5	Grulich in KČR 3
Sedum annuum	L.	Cras	neo 2	cas			E	1	Pyšek et al. 2002
Sedum hispanicum	L.	Cras	neo 3	nat	1954		M	408	Petřík & Joza in Kaplan et al. 2018a
Sedum hybridum	L.	Cras	neo 2	nat			As	48	Grulich in KČR 3
Sedum ochroleucum	Chaix	Cras	neo 3	nat			M	3	Holub 1972, Grulich in KČR 3
Sedum pallidum	M. Bieb.	Cras	neo 4	cas	2001		M	27	Pyšek et al. 2002, Hadinec & Lustyk 2008
Sedum rupestre subsp. *erectum*	't Hart	Cras	neo 3	cas			M	167	Grulich in KČR 3
Sedum sarmentosum	Bunge	Cras	neo 3	cas			As	11	Grulich in KČR 3
Sedum spurium	M. Bieb.	Cras	neo 2	nat	1879		E M	400	Grulich in KČR 3
Sedum stoloniferum	S. G. Gmel.	Cras	neo 4	cas	2001		E	3	Pyšek et al. 2002, Král et al. 2004b
Selaginella kraussiana	(Kunze) A. Braun	Sela	neo 4	cas	2019		Af	1	Sádlo in Lustyk & Doležal 2022, this study*
Sempervivum tectorum	L.	Cras	ar/neo	nat	1819		E	109	Grulich in KČR 3
Senecio ×helwingii	Beger	Aste	neo 2	cas			hybrid	1	Grulich in KČR 7
Senecio inaequidens	DC.	Aste	neo 3	inv	1997		Af	145	Ducháček et al. in Kaplan et al. 2018a*
Senecio vernalis	Waldst. et Kit.	Aste	neo 2	nat	1822		M	123	Grulich in KČR 7
Senecio vulgaris	L.	Aste	ar BR	nat			anec	593	Grulich in KČR 7
Setaria adhaerens	(Forssk.) Chiov.	Poac	neo 3	cas	1964	1964	Af	1	Kaplan et al. 2019a
Setaria faberi	R. A. W. Herrm.	Poac	neo 3	nat	1961		As	47	Chrtek in Kaplan et al. 2018a
Setaria italica	(L.) P. Beauv.	Poac	ar BR	cas			anec	102	Chrtek in Kaplan et al. 2018a*
Setaria pumila	(Poir.) Roem. et Schult.	Poac	ar NE	inv			M	439	Chrtek in Kaplan et al. 2018a*
Setaria verticillata	(L.) P. Beauv.	Poac	ar EM	inv			M	206	Chrtek in Kaplan et al. 2018a*
Setaria verticilliformis	Dumort.	Poac	ar *	nat			hybrid	14	Chrtek in Kaplan et al. 2018a
Setaria viridis subsp. *pycnocoma*	(Steud.) Tzvelev	Poac	neo 3	cas	1972		M	3	Chrtek in Kaplan et al. 2018, Kaplan et al. 2019a
Setaria viridis subsp. *viridis*	(L.) P. Beauv.	Poac	ar NE	inv			M	464	Chrtek in Kaplan et al. 2018*
Sherardia arvensis	L.	Rubi	ar *	nat			E M	398	Kubát in KČR 6
Sicyos angulatus	L.	Cucu	neo 2	cas	1880		AmN	27	Chrtková in KČR 2*
Sida hermaphrodita	(L.) Rusby	Malv	neo 3	cas	1958		AmN	1	Slavík in KČR 3
Sida rhombifolia subsp. *rhombifolia*	L.	Malv	neo 3	cas	1979		AmC AmS	1	Slavík in KČR 3
Sida spinosa	L.	Malv	neo 3	cas	1972		AmN & C & S	1	Slavík in KČR 3
Silene cretica	L.	Cary	neo 2	cas	1941	1943	M	2	Šourková 1978, Šourková in KČR 2
Silene csereii	Baumg.	Cary	neo 3	cas	1961	1964	E As	2	Danihelka & Hlisnikovský 2021a, this study*
Silene dichotoma subsp. *dichotoma*	Ehrh.	Cary	neo 2	nat	1841		M	212	Čelakovský 1875, Šourková in KČR 2, Danihelka & Kaplan in Pladias*
Silene gallica	L.	Cary	ar EM	cas			M	81	Lustyk in Hadinec & Lustyk 2014
Silene ×grecescui	Gu?ul.	Cary	neo 3	cas	1972		hybrid	1	Smejkal 1973, Šourková in KČR 2
Silene ×hampeana	Meusel et K. Werner	Cary	ar *	cas			hybrid	32	Šourková in KČR 2
Silene latifolia subsp. *alba*	(Mill.) Greuter et Burdet	Cary	ar ENE	nat			E M As	616	Šourková in KČR 2
Silene noctiflora	L.	Cary	ar BR	nat			E M	361	Šourková in KČR 2
Silene pendula	L.	Cary	neo 2	cas	1896	1972	M	10	Domin 1918, Šourková in KČR 2
Silene stricta	L.	Cary	neo 3	cas	1960	1960	M	1	Danihelka & Hlisnikovský 2021a, this study*
Silene viridiflora	L.	Cary	neo 3	cas	1971		E M	1	Smejkal 1973, Šourková in KČR 2
Silphium perfoliatum	L.	Aste	neo 2	cas	1885		AmN	3	Zelený in KČR 7
Silybum marianum	(L.) Gaertn.	Aste	ar LM	cas	1837		M	165	Koutecký in Kaplan et al. 2021
Sinapis alba	L.	Bras	ar/neo	cas	1875		M	214	Zelený in KČR 3
Sinapis arvensis	L.	Bras	ar NE	nat			anec	494	Zelený in KČR 3
Sinapis dissecta	Lag.	Bras	neo 3	cas	1953		M	1	Zelený in KČR 3
Sisymbrium altissimum	L.	Bras	neo 2	nat	1815		M	193	Dvořák in KČR 3
Sisymbrium austriacum subsp. *austriacum*	Jacq.	Bras	neo 2	cas	1858		E M	1	Dvořák in KČR 3
Sisymbrium irio	L.	Bras	neo 2	cas	1851		M As	11	Dvořák 1982, Dvořák in KČR 3
Sisymbrium loeselii	L.	Bras	ar/neo	inv	1819		E M As	250	Dvořák in KČR 3
Sisymbrium officinale	(L.) Scop.	Bras	ar EM	nat			M	553	Dvořák in KČR 3
Sisymbrium orientale subsp. *macroloma*	(Pomel) H. Lindb.	Bras	neo 3	cas	1958		M	1	Dvořák in KČR 3
Sisymbrium polymorphum	(Murray) Roth	Bras	neo 3	cas	1959		E As	1	Dvořák 1981, Dvořák in KČR 3
Sisymbrium strictissimum	L.	Bras	neo 2	nat	1819		E M	239	Dvořák in KČR 3
Sisymbrium volgense	E. Fourn.	Bras	neo 3	cas	1960		E	25	Jehlík 1971, 1981, 1998, Hejný et al. 1973, Dvořák in KČR 3*
Sisyrinchium montanum	Greene	Irid	neo 2	nat	1853		AmN	35	Chrtek in Kaplan et al. 2016b

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Smyrnium perfoliatum	L.	Apia	neo 2	nat	1886		M	19	Křísa in KČR 5, Hadinec in Hadinec et al. 2004
Solanum alatum	Moench	Sola	ar *	cas			E	4	Štěpánek in KČR 6, this study*
Solanum americanum	Mill.	Sola	neo 3	cas	1966		AmN & C & S	1	Štěpánek in KČR 6
Solanum carolinense	L.	Sola	neo 3	cas	1985		AmN	1	Štěpánek in KČR 6
Solanum cornutum	Lam.	Sola	neo 2	cas	1899		AmN	4	Štěpánek in KČR 6
Solanum decipiens	Opiz	Sola	neo 2	nat	1819		M	83	Štěpánek in KČR 6
Solanum linnaeanum	Hepper et P.-M. L. Jaeger	Sola	neo 2	cas			Af	1	Štěpánek in KČR 6
Solanum lycopersicum	L.	Sola	neo 2	nat	1880		anec	164	Štěpánek in KČR 6*
Solanum melongena	L.	Sola	neo 1	cas			anec	1	Štěpánek in KČR 6
Solanum physalifolium	Rusby	Sola	neo 3	cas	1975		AmS	11	Štěpánek in KČR 6, Hadinec & Lustyk 2006, Holec et al. 2006
Solanum pseudocapsicum	L.	Sola	neo 2	cas			AmS	1	Štěpánek in KČR 6
Solanum pyracanthos	Lam.	Sola	neo 2	cas	1940		Af	1	Štěpánek in KČR 6
Solanum scabrum	Mill.	Sola	neo 3	cas	1975		Af	1	Štěpánek in KČR 6
Solanum sisymbriifolium	Lam.	Sola	neo 2	cas	1934		AmS	2	Krist 1935
Solanum triflorum	Nutt.	Sola	neo 2	cas	1914		AmN	1	Štěpánek in KČR 6
Solanum tuberosum	L.	Sola	neo 1	cas			anec	236	Štěpánek in KČR 6
Solanum villosum	Mill.	Sola	neo 3	cas	1998		M	17	Štěpánek in KČR 6
Solidago canadensis	L.	Aste	neo 2	inv	1838		AmN	558	Slavík in KČR 7
Solidago gigantea	Aiton	Aste	neo 2	inv	1851		AmN	462	Slavík in KČR 7
Solidago graminifolia	(L.) Salisb.	Aste	neo 2	cas			AmN	1	Slavík in KČR 7
Sonchus arvensis subsp. *arvensis*	L.	Aste	ar BR	nat			M	569	Křísa in KČR 7
Sonchus asper	(L.) Hill	Aste	ar IR	nat			M	576	Křísa in KČR 7
Sonchus oleraceus	L.	Aste	ar EM	nat			M	586	Křísa in KČR 7
Sorbaria sorbifolia	(L.) A. Braun	Rosa	neo 2	nat	1940		As	40	Koblížek in KČR 3
Sorbus austriaca	(Beck) Hayek	Rosa	neo 4	cas	2008		E	13	Lepší et al. 2015, Lepší & Lepší in Kaplan et al. 2016a
Sorbus domestica	L.	Rosa	ar EM	nat			E M	60	Lepší et al. in Kaplan et al. 2016a*
Sorbus intermedia	(Ehrh.) Pers.	Rosa	neo 2	nat			E	82	Kovanda 1997, Lepší & Lepší in Kaplan et al. 2016a*
Sorbus latifolia	(Lam.) Pers.	Rosa	neo 2	cas	1914		E	7	Lepší et al. 2011, Lepší et al. in Kaplan et al. 2016a
Sorbus mougeotii	Soy.-Will. et Godr.	Rosa	neo 2	nat			E	3	Kovanda 1996, Lepší et al. 2013, Lepší & Lepší in Kaplan et al. 2016a*
Sorghum bicolor	(L.) Moench	Poac	neo 3	cas			Af	7	Kaplan et al. 2019a
Sorghum drummondii	(Steud.) Millsp. et Chase	Poac	neo 3	cas	1960		Af	1	Grüll 1979
Sorghum halepense	(L.) Pers.	Poac	neo 2	cas	1927		M	14	Jehlík 1998, Kaplan et al. 2019a
Spergula arvensis subsp. *arvensis*	L.	Cary	ar EM	nat			E M	403	Kaplan in Kaplan et al. 2020
Spergula arvensis subsp. *linicola*	(Boreau) Janch.	Cary	ar/neo	cas		1882	E M	4	Kaplan in Kaplan et al. 2020
Spergula arvensis subsp. *maxima*	(Weihe) O. Schwarz	Cary	ar/neo	cas		1952	E M	22	Kaplan in Kaplan et al. 2020
Spergula arvensis subsp. *sativa*	(Boenn.) Ces.	Cary	ar/neo	nat			E M	129	Kaplan in Kaplan et al. 2020
Spinacia oleracea	L.	Amara	ar/neo	cas			anec	14	Dostálek et al. in KČR 2
Spiraea alba	Du Roi	Rosa	neo 2	nat	1898		AmN	31	Businský & Velebil in Kaplan et al. 2023
Spiraea ×billardii	Hérincq	Rosa	neo 2	nat	1932		anec	38	Businský & Velebil in Kaplan et al. 2023
Spiraea chamaedryfolia	L.	Rosa	neo 2	nat	1896		E As	27	Businský & Velebil in Kaplan et al. 2023
Spiraea douglasii	Hook.	Rosa	neo 2	nat	1939		AmN	27	Businský & Velebil in Kaplan et al. 2023
Spiraea japonica	L. f.	Rosa	neo 3	cas	1995		As	45	Křivánek 2008, Pyšek et al. 2012b, Businský & Velebil in Kaplan et al. 2023
Spiraea latifolia	(Ait.) Borkh.	Rosa	neo 2	cas	1946		AmN	5	Businský in Kaplan et al. 2019a, Velebil & Businský in Kaplan et al. 2023, this study*
Spiraea ×macrothyrsa	Dippel	Rosa	neo 2	nat	1946		hybrid	26	Businský & Velebil in Kaplan et al. 2023
Spiraea ×pseudosalicifolia	Silverside	Rosa	neo 2	nat	1946		hybrid	18	this study, Businský & Velebil in Kaplan et al. 2023*
Sporobolus elongatus	R. Br.	Poac	neo 3	cas	1960	1960	AmC AmS	1	Dvořák & Kühn 1966, Kaplan in Hadinec & Lustyk 2014*
Sporobolus vaginiflorus	(A. Gray) Alph. Wood	Poac	neo 4	cas	2020		AmN	1	Kúr & Paulič in Lustyk & Doležal 2021, this study*
Stachys affinis	Bunge	Lami	neo 2	cas	1924		As	1	Novák 1924, Chrtek 1994, Kaplan et al. 2019a
Stachys annua	(L.) L.	Lami	ar ENE	nat			M	168	Chrtek in Kaplan et al. 2019b
Stachys arvensis	(L.) L.	Lami	ar EM	cas			M	24	Chrtek in KČR 6, Chrtek in Hadinec & Lustyk 2006
Stachys byzantina	K. Koch	Lami	neo 3	nat			M	39	Chrtek in KČR 6*
Stachys setifera	C. A. Mey.	Lami	neo 4	cas	2007		M	1	Řehořek et al. in Hadinec & Lustyk 2009

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Suaeda salsa	(L.) Pall.	Amara	neo 4	cas	2014		E As	6	Štech & Prach in Hadinec & Lustyk 2015, Ducháček et al. in Kaplan et al. 2017b, this study*
Symphoricarpos albus	(L.) S. F. Blake	Capr	neo 2	inv			AmN	510	Chrtek in KČR 5
Symphoricarpos orbiculatus	Moench	Capr	neo 2	cas			AmN	14	Chrtek in KČR 5
Symphyotrichum cordifolium	(L.) G. L. Nesom	Aste	neo 2	cas	1876		AmN	2	Kovanda & Kubát in KČR 7
Symphyotrichum dumosum × *S. novi-belgii*		Aste	neo 2	cas			hybrid	1	Kovanda & Kubát in KČR 7
Symphyotrichum laeve	(L.) A. Löve et D. Löve	Aste	neo 2	nat	1851		AmN	19	Kovanda & Kubát in KČR 7
Symphyotrichum laeve × *S. lanceolatum*		Aste	neo 2	cas			hybrid	1	Kovanda & Kubát in KČR 7
Symphyotrichum lanceolatum	(Willd.) G. L. Nesom	Aste	neo 2	inv			AmN	125	Kovanda & Kubát in KČR 7
Symphyotrichum novae-angliae	(L.) G. L. Nesom	Aste	neo 2	cas			AmN	29	Kovanda & Kubát in KČR 7
Symphyotrichum novi-belgii	(L.) G. L. Nesom	Aste	neo 2	inv	1850		AmN	152	Kovanda & Kubát in KČR 7
Symphyotrichum ×*salignum*	(Willd.) G. L. Nesom	Aste	neo 2	inv	1872		hybrid	33	Kovanda & Kubát in KČR 7
Symphyotrichum ×*versicolor*	(Willd.) G. L. Nesom	Aste	neo 2	inv			anec	10	Kovanda & Kubát in KČR 7
Symphytum asperum	Lepech.	Bora	neo 2	cas	1872		M anec	21	Kobrlová & Hroneš in Kaplan et al. 2016a
Symphytum grandiflorum	DC.	Bora	neo 2	cas	2016		E	1	Kobrlová & Hroneš 2017, this study*
Symphytum ×*hidcotense*	P. D. Sell	Bora	neo 2	cas	2016		hybrid	1	Kobrlová & Hroneš 2017, this study*
Symphytum tauricum	Willd.	Bora	neo 3	cas	1985	1987	E As	2	Kobrlová & Hroneš in Kaplan et al. 2016a, this study*
Symphytum ×*uplandicum*	Nyman	Bora	neo 2	nat	1927		anec	65	Kobrlová & Hroneš in Kaplan et al. 2016a
Syringa vulgaris	L.	Olea	neo 1	nat	1809		E	418	Koblížek in KČR 5
Tagetes erecta	L.	Aste	neo 1	cas	1901		AmN AmC	15	Domin 1919, Uher in Lustyk & Doležal 2019
Tagetes patula	L.	Aste	neo 1	cas			AmN AmC	15	Bělohlávková in KČR 7
Tagetes tenuifolia	Cav.	Aste	neo 4	cas	2009		AmN	1	Pyšek et al. 2012b
Tanacetum balsamita	L.	Aste	ar/neo	cas			E M	11	Zelený in KČR 7
Tanacetum macrophyllum	(Waldst. et Kit.) Sch. Bip.	Aste	neo 3	nat			E M	24	Zelený in KČR 7
Tanacetum parthenium	(L.) Sch. Bip.	Aste	ar/neo	nat			E M	368	Zelený in KČR 7
Tanacetum vulgare	L.	Aste	ar EM	nat			E	653	Zelený in KČR 7
Telekia speciosa	(Schreb.) Baumg.	Aste	neo 2	inv	1900		E	252	Kaplan in Kaplan et al. 2019b
Tellima grandiflora	(Pursh) Lindl.	Saxi	neo 4	cas	2012		AmN	2	Uher in Hadinec & Lustyk 2015, this study*
Teloxys aristata	(L.) Moq.	Amara	neo 4	cas	2016		E As	1	Uher in Hadinec & Lustyk 2017, this study*
Tetragonia tetragonoides	(Pall.) Kuntze	Aizo	neo 2	cas	1903		AmS As Au	5	Domin 1917
Teucrium hircanicum	L.	Lami	neo 4	cas	2011		E As	1	Nepraš et al. 2011, this study*
Teucrium polium	L.	Lami	neo 3	cas	1960	1962	M	1	Kilián & Krkavec 1962, Mártonfi in KČR 6
Thermopsis villosa	(Walter) Fernald et B. G. Schub.	Faba	neo 4	cas	2018		AmN	1	Čech & Lustyk in Lustyk & Doležal 2020, this study*
Thladiantha dubia	Bunge	Cucu	neo 2	cas	1939		As	34	Chrtková in KČR 2
Thlaspi arvense	L.	Bras	ar NE	nat			M	616	Dvořáková in KČR 3
Thuja occidentalis	L.	Cupr	neo 4	cas	2012		AmN	120	Pyšek et al. 2012b
Thuja plicata	D. Don	Cupr	neo 4	cas			AmN	35	Lepší & Lepší 2013, Šumberová in Hadinec & Lustyk 2015, this study*
Thymus drucei	Ronniger	Lami	neo 3	cas	1974		E	1	Čáp 1982, Štěpánek & Tomšovic in KČR 6
Thymus vulgaris	L.	Lami	ar/neo	cas			M	18	Štěpánek & Tomšovic in KČR 6
Tilia tomentosa	Moench	Malv	neo 4	cas	2001		E	25	Pyšek et al. 2002
Tolpis staticifolia	(All.) Sch. Bip.	Aste	neo 2	cas	1873		E	1	Štech in KČR 7
Tordylium apulum	L.	Bras	neo 4	cas	2015		M	1	Doležal in Hadinec & Lustyk 2016, this study*
Torilis arvensis subsp. *arvensis*	(Huds.) Link	Apia	ar *	nat			M	52	Hrouda in KČR 5
Torilis nodosa	(L.) Gaertn.	Apia	neo 2	cas	1918		M	1	Domin 1918
Toxicodendron pubescens	Mill.	Anac	neo 2	cas	1874		AmN	3	Skalická in KČR 5*
Toxicodendron radicans	(L.) Kuntze	Anac	neo 4	cas	2018		AmN AmC	1	Chytrá 2021, Hlisnikovský 2022, this study*
Trachyspermum ammi	(L.) Turrill	Apia	neo 2	cas	1903		anec	1	Hadinec & Lustyk 2012
Tradescantia ×*andersoniana*	W. Ludw. et Rohweder	Comm	neo 3	cas	1987	2008	AmN	1	this study*
Tragopogon dubius	Scop.	Aste	ar *	nat			M	250	Kaplan in KČR 7

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Tragopogon porrifolius subsp. *porrifolius*	L.	Aste	neo 2	cas	1838		M	2	Kaplan in KČR 7
Tragus racemosus	(L.) All.	Poac	neo 4	nat	1839		M	14	Zázvorka in Kaplan et al. 2015, Zázvorka in Lustyk & Doležal 2018*
Tribulus terrestris	L.	Zygo	neo 3	cas	1960		M	12	Kilián & Krkavec 1961
Trifolium alexandrinum	L.	Faba	neo 3	cas	1960		anec	3	Kilián & Krkavec 1962, Kubát in KČR 4, Grulich in Hadinec & Lustyk 2011
Trifolium alpinum	L.	Faba	neo 2	cas	1919		E	7	Kubát in KČR 4
Trifolium angulatum	Waldst. et Kit.	Faba	neo 3	cas	1976		M	1	Kubát in KČR 4
Trifolium angustifolium	L.	Faba	neo 2	cas	1923		M	1	Kubát in KČR 4
Trifolium badium	Schreb.	Faba	neo 2	nat			E	2	Pyšek et al. 2012b
Trifolium diffusum	Ehrh.	Faba	neo 3	cas	1923	1923	E M As	1	Podpěra 1937*
Trifolium glomeratum	L.	Faba	neo 3	cas	1961		M	2	Kubát in KČR 4
Trifolium hybridum subsp. *hybridum*	L.	Faba	ar/neo	nat	1819		anec	619	Kubát in KČR 4
Trifolium incarnatum subsp. *incarnatum*	L.	Faba	neo 2	cas	1870		M	101	Kubát in KČR 4
Trifolium lappaceum	L.	Faba	neo 2	cas	1916		M	1	Kubát in KČR 4
Trifolium ornithopodioides	L.	Faba	neo 3	cas	1960		M	1	Kubát in KČR 4
Trifolium pallidum	Waldst. et Kit.	Faba	neo 2	cas	1930		M	1	Kubát in KČR 4
Trifolium pannonicum	Jacq.	Faba	neo 2	nat	1919		M	4	Hendrych 1968, Kubát in KČR 4
Trifolium resupinatum	L.	Faba	neo 2	cas	1853		M	26	Kubát in KČR 4
Trifolium squamosum	L.	Faba	neo 2	cas	1930		M	1	Kubát in KČR 4
Trifolium subterraneum	L.	Faba	neo 3	cas	1962		M	2	Kubát in KČR 4
Trifolium tomentosum	L.	Faba	neo 3	cas	1961	1961	M	1	Dvořák & Kühn 1966
Trifolium vesiculosum	Savi	Faba	neo 4	cas	2009		E M	2	Řehořek in Hadinec & Lustyk 2012
Trigonella caerulea	(L.) Ser.	Faba	neo 2	cas	1874		M	2	Chrtková in KČR 4
Trigonella foenum-graecum	L.	Faba	neo 2	cas	1889		anec	2	Chrtková in KČR 4
Tripleurospermum inodorum	(L.) Sch. Bip.	Aste	ar IR	nat			anec	634	Kubát in KČR 7
×*Tripleurothemis maleolens*	(P. Fourn.) Stace	Aste	ar *	cas	1886	1886	hybrid	1	Čelakovský 1888d, this study*
Triticum aestivum Aestivum Group		Poac	ar NE	cas			anec	342	Kaplan et al. 2019a
Triticum turgidum Dicoccon Group		Poac	ar NE	cas			anec	1	Kaplan et al. 2019a
Triticum turgidum Polonicum Group		Poac	neo 3	cas			anec	1	Kaplan et al. 2019a
Triticum turgidum Turgidum Group		Poac	neo *	cas			anec	1	Kaplan et al. 2019a
Tropaeolum majus	L.	Trop	neo 1	cas			anec	27	Bělohlávková in KČR 5
Tulipa ×*gesneriana*	L.	Lili	neo 1	cas			anec	35	Pyšek et al. 2002
Tulipa sylvestris	L.	Lili	neo 1	nat	1867		M	24	Bělohlávková in KČR 8
Turgenia latifolia	(L.) Hoffm.	Apia	ar *	cas			M	13	Hrouda in KČR 5
Typha laxmannii	Lepech.	Typh	neo 3	nat	1968		E	51	Kaplan in Kaplan et al. 2019b
Ulex europaeus	L.	Faba	neo 2	cas	1880		E	3	Skalická in KČR 4
Urochloa platyphylla	(C. Wright) R. D. Webster	Poa	neo 3	cas	1991	1993	AmN & C & S	3	Jehlík 2013, this study*
Urtica pilulifera	L.	Urti	neo 2	cas	1872		M	1	Chrtek in KČR 1
Urtica urens	L.	Urti	ar BR	nat			M	438	Chrtek in KČR 1
Vaccaria hispanica	(Mill.) Rauschert	Cary	ar EM	cas		1981	M	186	Kaplan & Danihelka in Kaplan et al. 2022
Vaccinium corymbosum	L.	Eric	neo 4	cas	2011		AmN	2	Pyšek et al. 2012b
Valerianella dentata	(L.) Pollich	Vale	ar BR	nat			M	504	Danihelka & Kaplan in Kaplan et al. 2016a*
Valerianella rimosa	Bastard	Vale	ar IR	nat			M	148	Danihelka & Kaplan in Kaplan et al. 2016a*
Vallisneria spiralis	L.	Hydro	neo 4	cas			As	4	Husák et al. in KČR 8
Verbascum niveum subsp. *visianianum*	(Rchb.) Murb.	Scro	neo 2	cas	1914	1914	M	1	Kirschner in KČR 6
Verbena bonariensis	L.	Verb	neo 4	cas	2002		AmS	10	Šumberová in Kaplan et al. 2023
Verbena ×*hybrida*	Groenland et Rümpler	Verb	neo 4	cas	2003		anec	3	Šumberová in Kaplan et al. 2023
Verbena officinalis	L.	Verb	ar BR	nat			M	336	Šumberová in Kaplan et al. 2023
Verbena peruviana	(L.) Britton	Verb	neo 2	cas	1853		AmS	1	Slavík in KČR 6, Šumberová in Kaplan et al. 2023
Verbena rigida	Spreng.	Verb	neo 3	cas	1967		AmS	1	Šumberová in Kaplan et al. 2023
Veronica agrestis	L.	Plan	ar *	nat			M	274	Dřevojan & Danihelka in Kaplan et al. 2017b
Veronica arvensis	L.	Plan	ar/neo	nat			M	624	Dřevojan & Danihelka in Kaplan et al. 2017b
Veronica filiformis	Sm.	Plan	neo 2	nat	1938		M	259	Danihelka in Kaplan et al. 2016b
Veronica gentianoides	Vahl	Plan	neo 2	cas	1939	1993	E As	1	Danihelka & Harčarik 2019, this study*
Veronica hederifolia	L.	Plan	ar NE	nat			M	434	Hrouda in KČR 6

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Veronica incana × *V. maritima*		Plan	neo 2	cas	1940		hybrid	1	Trávníček in KČR 6
Veronica incana subsp. *incana*	L.	Plan	neo 3	cas			E As	3	Trávníček 1998, Trávníček in KČR 6
Veronica opaca	Fr.	Plan	ar *	nat			M	163	Dřevojan & Danihelka in Kaplan et al. 2017b
Veronica peregrina	L.	Plan	neo 1	nat	1871		AmN & C & S	109	Danihelka in Kaplan et al. 2016b*
Veronica persica	Poir.	Plan	neo 1	nat	1810		M	609	Dřevojan & Danihelka in Kaplan et al. 2017b
Veronica polita	Fr.	Plan	ar BR	nat			M	388	Dřevojan & Danihelka in Kaplan et al. 2017b
Veronica triloba	(Opiz) Opiz	Plan	ar *	nat			M	88	Danihelka in Kaplan et al. 2017b
Veronica triphyllos	L.	Plan	ar *	nat			M	336	Hrouda in KČR 6
Viburnum rhytidophyllum	Hemsl.	Adox	neo 4	cas	2011		As	17	Pyšek et al. 2012b
Vicia angustifolia	L.	Faba	ar IR	nat			M	569	Chrtková in KČR 4
Vicia articulata	Hornem.	Faba	neo 2	cas	1874		M	7	Chrtková in KČR 4
Vicia bithynica	(L.) L.	Faba	neo 2	cas	1949	1949	M	1	Sutorý 1976, Chrtková in KČR 4
Vicia ervilia	(L.) Willd.	Faba	ar BR	cas			M	1	Chrtková in KČR 4
Vicia faba	L.	Faba	ar BR	cas			anec	43	Chrtková in KČR 4
Vicia grandiflora	Scop.	Faba	neo 2	nat	1877		E M	39	Chrtková in KČR 4
Vicia lutea	L.	Faba	neo 3	cas			E M	22	Chrtková in KČR 4
Vicia melanops	Sm.	Faba	neo 2	cas	1900		M	1	Chrtková in KČR 4
Vicia narbonensis	L.	Faba	ar/neo	cas			M	2	Chrtková in KČR 4
Vicia onobrychioides	L.	Faba	neo 3	cas	1980		M	1	Saul 1983, Chrtková in KČR 4
Vicia pannonica subsp. *pannonica*	Crantz	Faba	ar *	nat			M	42	Chrtková in KČR 4
Vicia pannonica subsp. *striata*	(M. Bieb.) Nyman	Faba	ar *	nat			M	37	Chrtková in KČR 4
Vicia sativa	L.	Faba	ar BR	nat			M As Af	411	Chrtková in KČR 4
Vicia villosa subsp. *varia*	(Host.) Corb.	Faba	ar *	nat			M	136	Chrtková in KČR 4
Vicia villosa subsp. *villosa*	Roth	Faba	ar LM	nat			M	172	Chrtková in KČR 4
Vinca minor	L.	Apoc	ar/neo	nat			E	519	this study*
Viola canadensis var. *rugulosa*	(Greene) C. L. Hitchc.	Viol	neo 2	cas	1948	1948	AmN	1	Kirschner & Štěpánek 1984, Kirschner & Skalický in KČR 2
Viola cornuta	L.	Viol	neo 3	cas	1959		E	14	Skalický 1973, Kirschner & Skalický in KČR 2
Viola cucullata	Aiton	Viol	neo 2	cas	1895	1895	AmN	1	Kirschner & Štěpánek 1984, Kirschner & Skalický in KČR 2
Viola ×haynaldii	Wiesb.	Viol	ar/neo	cas	1886		hybrid	3	Kirschner & Skalický in KČR 2
Viola ×hungarica	Degen et Sabr.	Viol	ar/neo	cas			hybrid	4	Kirschner & Skalický in KČR 2
Viola ×kerneri	Wiesb.	Viol	ar/neo	cas	1904		hybrid	1	Kirschner & Skalický in KČR 2
Viola ×multicaulis	Jord.	Viol	ar/neo	cas			hybrid	3	Kirschner & Skalický in KČR 2
Viola odorata	L.	Viol	ar EM	nat			M	495	Kirschner & Skalický in KČR 2
Viola ×poelliana	Murr	Viol	ar/neo	cas			hybrid	1	Kirschner & Skalický in KČR 2
Viola ×porphyrea	R. Uechtr.	Viol	ar/neo	cas			hybrid	22	Kirschner & Skalický in KČR 2
Viola ×scabra	F. Braun	Viol	ar/neo	nat			hybrid	130	Kirschner & Skalický in KČR 2
Viola septemloba	Leconte	Viol	neo 3	nat	2003		AmN	1	Sutorý in Hadinec & Lustyk 2008
Viola sororia	Willd.	Viol	neo 4	cas	2016		AmN	1	Kaplan et al. 2019a, this study*
Viola ×sourekii	F. Proch.	Viol	neo 2	cas			hybrid	1	Kirschner & Skalický in KČR 2
Viola suavis subsp. *suavis*	M. Bieb.	Viol	ar/neo	nat			M	28	Kirschner & Skalický in KČR 2, Fajmon in Hadinec & Lustyk 2008
Viola ×vindobonensis	Wiesb.	Viol	ar/neo	cas			hybrid	3	Kirschner & Skalický in KČR 2
Viola ×wittrockiana	Nauenb. et Buttler	Viol	neo 2	cas			anec	34	Kirschner & Skalický in KČR 2
Vitis riparia	Michx.	Vita	neo 3	cas	1964		AmN	11	Koblížek in KČR 5
Vitis vinifera subsp. *vinifera*	L.	Vita	ar RMP	cas			anec	9	Koblížek in KČR 5
Vulpia bromoides	(L.) Gray	Poac	ar *	nat			M	50	Kaplan et al. 2019a
Vulpia ciliata	Dumort.	Poac	neo 2	cas	1929	1969	M	1	Pečinka in KČR 9
Vulpia ligustica	(All.) Link	Poac	neo 2	cas	1926	1926	M	1	Pečinka in KČR 9
Vulpia myuros	(L.) C. C. Gmel.	Poac	ar *	inv			M	213	Kaplan et al. 2019a*
Waldsteinia geoides	Willd.	Rosa	neo 2	cas			E	5	Smejkal in KČR 4
Waldsteinia ternata subsp. *trifolia*	(W. D. J. Koch) Teppner	Rosa	neo 2	cas			E	2	Smejkal in KČR 4
Wisteria sinensis	(Sims) Sweet	Faba	neo 4	cas	2018		As	10	Sádlo in Lustyk & Doležal 2020, this study*
Xanthium albinum	(Widder) H. Scholz et Sukopp	Aste	neo 2	nat	1849		AmN	76	Danihelka & Dřevojan in Kaplan et al. 2021
Xanthium ×kostalii	Tocl	Aste	neo 2	cas	1854		hybrid	1	Havlíček in KČR 7
Xanthium ripicola	Holub	Aste	neo 2	cas	1905	1983	AmN	3	Danihelka & Dřevojan in Kaplan et al. 2021

Taxon	Author	Fam	Res	Inv	1st	LR	Origin	Occup	Source
Xanthium saccharatum	Wallr.	Aste	neo 3	cas	1965		AmN AmS	5	Danihelka & Dřevojan in Kaplan et al. 2021*
Xanthium spinosum	L.	Aste	neo 2	cas	1840		AmS	109	Danihelka & Dřevojan in Kaplan et al. 2021
Xanthium strumarium	L.	Aste	ar EM	nat			E M	171	Danihelka & Dřevojan in Kaplan et al. 2021*
Xerochrysum bracteatum	(Vent.) Tzvelev	Aste	neo 3	cas	1991		Au	1	Růžička & Zlámalík 1997
Yucca flaccida	Haw.	Aspa	neo 4	cas	2014		AmN	5	Uher et al. in Lustyk & Doležal 2019, this study*
Zea mays	L.	Poac	neo 1	cas			anec	142	Kaplan et al. 2019a
Zelkova serrata	(Thunb.) Makino	Ulma	neo 3	cas	1973		As	4	Pyšek et al. 2002
Zinnia elegans	Jacq.	Aste	neo *	cas			AmS	1	Bělohlávková in KČR 7