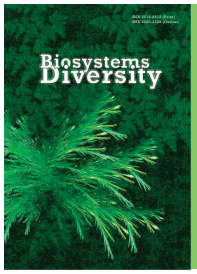

Biosystems Diversity

ISSN 2519-8513 (Print)
ISSN 2520-2529 (Online)
Biosyst. Divers.,
2020, 28(1), 98–112
doi: 10.15421/012014

Ecological-climatic characteristics of the flora of a floodplain landscape in Southeastern Europe

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Article info

Received 02.02.2020
Received in revised form 27.02.2020
Accepted 28.02.2020

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Baranovski, B. A., Karmyzova, L. A., Roshchyna, N. O., Ivanko, I. A., & Karas, O. G. (2020). Ecological-climatic characteristics of the flora of a floodplain landscape in Southeastern Europe. Biosystems Diversity, 28(1), 98–112. doi:10.15421/012014

Floodplain ecosystems take on the role of active areas of biodiversity and provide many "ecosystem services", as evidenced by a number of European scientific references. A biodiversity analysis of river floodplains in six European countries within the temperate zone has shown that the floodplains are habitats with a high-level of structural and functional dynamics. The level of their conservation reflects the floristic diversity of forest territories, which is especially important for subarid areas. Recently, a comparison of bioecological characteristics of flora in floodplain forest areas and treeless territories was conducted on the floodplain landscapes of a subarid region of Europe. The valley-terraced landscape of the Samara River, a tributary of the Dnieper can serve as a reference site of native plant complexes of subarid territory in Eastern Europe. Despite long-term anthropogenic transformation, the landscape has retained a significant phytodiversity level. The flora of the Samara River area includes 887 plant species. Of these, 177 species belonging to the rare and endangered categories. The floodplain landscape is the richest in species and most diverse part of this complex. The flora of the Samara floodplain includes 728 species (including 132 rare ones), of which 631 grow in forest communities, and 487 – in anthropogenically transformed, treeless floodplain areas. As part of the forest flora, the number of tree and shrubby species, scyophytes, hygrophytes, and megatrophs significantly increases compared to treeless sites, and the number of ruderal plant species decreases. The floristic composition of the floodplain forests of the subarid region is much richer and more diverse than the flora of the treeless floodplain areas, and this should encourage measures for their protection and restoration. Afforestation of floodplain territories within the steppe zone of Ukraine should be a priority in comparison with other landscapes. For the protection of the flora studied, a scientific justification for creating the National Park "Samara Bor" was prepared. Under the conditions of anthropogenic and climatic impact, this article is of great global importance for attracting the attention of specialists, authorities and society to the protection and restoration of biodiversity in the most valuable landscapes.

Keywords: valley-terrace landscape; floodplain; forest plant communities; ecomorphs; rare plant species; adventive species.

Introduction

Vascular plant flora is one of the most numerous and stable components which represents the state of ecosystems. The territories of European river floodplains are characterized by a high-level of biodiversity. They are represented by habitats with a high level of structural and functional dynamics (Schindler et al., 2016). Some of them can serve as reference sites with the best-preserved floral richness. One of these areas on the territory of the steppe zone of Eastern Europe is the floodplain landscape of the Samara River, a tributary of the Dnieper (Koshelev et al., 2020).

Today, the importance of forest ecosystems (especially in subarid regions) is of inestimable importance. They reduce the effects of global warming and create conditions for biodiversity conservation and recreation (Bussotti et al., 2015; Biurrun et al., 2016; Hossain et al., 2016; Colangelo et al., 2018). The development, sustainability and biodiversity of forest ecosystems, including those within floodplain habitats, depend mainly on climate and hydrological conditions (Mikac et al., 2 018; Stojanović et al., 2016). The only areas of forest growth in the steppe zone are the gullies (ravine forests) and floodplains (floodplain forests). The lack of atmospheric moisture is compensated by floodwaters. Tree species respond positively to floodwaters, even when floodplains are at their maximum (Heklau et al., 2019). The floodplain landscape is characterized by a richness of biotopes (forest, meadow, wetland), which create a variety of climatopical conditions not typical for steppe landscapes, especially in recent decades of global warming (Lavergne et al., 2010; Ortmann-Ajkai et al., 2018).

One of the significant woodlands of the steppe zone within Eastern Europe is the Samara Forest, which serves as the "southern outpost" of forest distribution in the steppe zone of Ukraine (Bel'gard, 1950). It is located downstream of the Samara River, a tributary of the Dnieper. On the territory of the steppe zone of Ukraine, this woodland is the only one of the remaining large floodplain forests of the middle river valleys. On the territory of the floodplain landscape of the Samara River, forest vegetation is represented by oak forests. The forests alternate with meadows, swamps, and water bodies (Brygadyrenko, 2015, 2016).

The diverse landscapes and rich flora of the Samara River area have attracted the attention of several well-known botanists. One of the species from the territory of of the Samara River area was described by Carl Linnaeus: *Veronica incana* L. (Elenevskij, 1978), the type stored in London. Detailed flora and vegetation surveys in this territory (including the floodplain landscape) were initiated at the end of the XIX century by Akinfiev (1908), the famous Ukrainian botanist. In the following years, the study of flora and vegetation was carried out by followers of the geobotanical scientific school of A. L. Belgard (Alekseyev et al., 1986, Tarasov et al., 1988; Tarasov, 2012; Baranovsky, 2016).

The flora of the Samara River area has historically been composed of different geographical elements and is distinguished by a large set of species and their ecomorphs (Belgard, 1950). The elements include a large number of rare plant species and a minimal number of adventive ones (Chervona knyha, 2010; Tarasov, 2012; Baranovsky, 2016). They are widely represented in all landscape elements of the Samara River area and especially in the floodplain. A variety of ecological conditions was developed in the forest area of the floodplain, which provides greater flora richness and diversity compared to transformed territories (Schindler et al., 2016).

In this regard, the task of our work was to compare the climatopes and ecofloristic diversity of the floodplain forest areas of the Samara River

and anthropogenically transformed territories where the forest was destroyed. This is well illustrated by the A. L. Belgard Ecomorph System, which was the first vascular plant ecomorph system (Baranovsky et al., 2018). Finding out the specific values of phytodiversity in floodplain forest areas will help initiate measures for their protection and restoration.

Materials and methods

The survey subject was the microclimatic features and floodplain vascular flora of the Samara River in its downstream area (between Kocherechki village and Volnoye village). Coordinates: Volnoye: 48.7281°N, 35.2931°E; Kocherechki 48.6370°N, 35.6900°E; Ivano-Mikhaylovka 48.7736°N, 35.3750°E; Cherkasskoye 48.6786°N, 35.3764°E (Fig. 1). One of the climate features in the Samara River area, which is located within the steppe Atlantic-continental climate type, is the high temperatures of the warm period with reduced precipitation and significant air dryness. The average annual air temperature is 8.1 °C, and the average annual precipitation is 545 mm (Gorb & Duk, 2006). Average annual amplitude of air temperature is 26.8 °C. The average temperature and humidity (Table 1) of this region (Hubynykha weather forecast) show the most intense temperature rise in the period from March to April (8.8 °C) and the most intense drop in temperature from September to October (6.9 °C).

The scientific basis for the survey of climatopes in native forest biogeocenoses was the doctrine of the forests' influence on environmental change (the doctrine of forest pertinence) of Vysotsky (1950). Climate research was conducted according to widely accepted methods. A set of standard methods of hydrometeorological observations was carried out at the test sites, and the gradient climate stand proposed by Gritsan (2000) was used, which allows meteorological elements to be measured at any level from the soil surface and tree crowns (Grytsan et al., 2005) The hydrological features of the of the middle river floodplains in the steppe zone are characterized by short-term flooding (Ramenskiy, 1971). The territory of the Samara River floodplain is flooded during high water for a period of about one week (Belgard, 1950). This determines mainly sufficient moisture for oak forests under short-term flooding conditions.

Table 1
Climatic indicators of the Samara River area (Hubynykha)

Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Average monthly air temperature °C*	–6.1	–4.7	0.4	9.2	15.9	19.2	20.7	20.0	14.8	7.9	2.0	–2.6
Average monthly relative air humidity %	89	88	84	68	60	61	61	60	65	77	87	89
Precipitation norm, mm	48	34	31	40	46	69	58	43	41	36	44	55

Fig. 1. Diagrammatic map of the downstream territory of the Samara River area (hatching indicates the floodplain territory)

The vascular plant flora survey was conducted from 1998 to 2019. To compile a complete flora list, materials from the herbarium collections of Dnipropetrovsk University and the National Herbarium of the Institute of Botany, National Academy of Sciences of Ukraine were used. 1300 herbarium samples were collected. The flora of different floodplain biotopes and different types of water bodies was surveyed (Roshchyna & Baranovski, 2019). The definition of vascular plant species was carried out according to the following identification manuals and "Flora" (Flora of the USSR, 1935–1963; Prokudin & Dobrochaeva, 1987). Plant species names were given according to the nomenclature publication adopted in Ukraine (Mosyakin & Fedorochuk, 1999).

Bioecomorphic flora analysis was carried out according to the ecomorph system of Belgard (1950). For ecomorphic characterization of species, we used existing publications (Belgard, 1950; Baranovski, 2000; Tarasov, 2012), consultations with leading experts of the Institute of Botany of National Academy of Sciences of Ukraine, as well as our presonal data (Baranovsky et al., 2017, 2018).

Results

The greatest differences in meteorological elements were observed between the floodplain and steppe landscapes in summer during the period of the greatest development of crown leaves. The weakened turbulent air exchange reduces the average daily temperature by 0.5–2.0 °C and increases the average daily relative humidity by 10–16%. The maximum temperature of the soil surface is reduced by 7–15 °C in comparison with the values of steppe landscape. With variable cloud cover, amplitude of temperature fluctuations of the soil surface in forest areas on average is up to 7.0 °C, and in conditions of the steppe landscape the amplitude is more than 20 °C.

Forested areas have inherent climate features in a number of different biotopes: riverbeds, lakes, swamps, forest margins, and glades. Surveys of climatopes have revealed that light intensity and energy supply in the field of PAR (photosynthetically active radiation) increases in the following sequence of biotopes: oak forest → forest margin → woodland water body. Light intensity under the canopy of oak forest during the light period of the day is reduced by an average of 95.2% in comparison with non-wooded areas. Significant reflectivity of the surface of a water body provides additional solar radiation in the FAW range of the lower part of the crowns and undergrowth. Amplitude of daily temperature fluctuations in the forest glade biotope is 1.4 times greater than in the water body and forest biotopes.

All these factors impact significantly on the ecosystem functioning. They provide the basis of the floral diversity of floodplain biogeocenoses. Floral diversity of the biogeocenoses is incomparably richer than the rest of the territory. The flora of vascular plants of the Samara floodplain is very diverse both in systematic and ecological terms. A wide range of different ecomorphs are represented here (Table 2).

The vascular plant species list of the floodplain habitats in the Samara forest includes 728 species. They belong to 4 divisions, 5 classes, 108 families, 429 genera (Table 2). Of these, 148 species are rare, which are included in the European Red List (2 species), the Red Book of Ukraine (24 species) and the regional Red List of the Dnipropetrovsk region (148 species) (Chervona knyha..., 2010).

Table 2
Flora of the floodplain landscape in the Samara River downstream

Family Views	Clima-morphs	Thermo-morphs	Helio-morphs	Tropho-morphs	Hygro-morphs	Ceno-morphs	The rare flora fraction, adventive status	Types of forested areas	Types of non-forested areas
1	2	3	4	5	6	7	8	9	10
Divisio Equisetophyta									
Equisetaceae									
Equisetum arvense L.	G	MsT	ScHe	MsTr	HgMs	RuSilPr	–	+	+
E. fluviatile L.	HKr	MsT	ScHe	MsTr	HelHg	AqPal	RLD	+	+
E. hyemale L.	Ch	MsT	ScHe	MsTr	HgMs	PrSil	RLD	+	–
E. pratense Ehrh.	G	MsT	ScHe	MsTr	HgMs	Pr	–	–	+
E. ramosissimum Desf.	G	MsT	ScHe	MsOgTr	Ms	PrPs	–	–	+
E. sylvaticum L.	G	MsT	Sc	MsTr	HgMs	Sil	RLD	+	–
Divisio Polypodiophyta									
Aspleniaceae									
Asplenium trichomanes L.	HKr	MsT	HeSc	MsTr	Ms	SilPt	RLD	+	–
Athyriaceae									
Athyrium filix-femina (L.) Roth	HKr	MgT	Sc	MsTr	HgMs	Sil	RLD	+	–
Cystopteris fragilis Bernh.	HKr	MgT	HeSc	MsOgTr	Ms	PsSil	RLD	+	–
Dennstaedtiaceae									
Pteridium aquilinum (L.) Kuhn	G	MT	HeSc	OgMsTr	Ms	Sil	RLD	+	–
Dryopteriaceae									
Dryopteris carthusiana H. P. Fuchs.	HKr	MsT	ScHe	MsTr	Ms	Sil	RLD	+	–
D. cristata (L.) A. Grey	HKr	MsT	HeSc	OgMsTr	MsHg	Sil	RLD	+	–
D. filix-mas (L.) Schott.	HKr	MsT	HeSc	OgMsTr	Ms	Sil	RLD	+	–
Polystichum aculeatum (L.) Roth	HKr	MgT	Sc	OgMsTr	HgMs	PtSil	RLD	+	–
Onocleaceae									
Matteuccia struthiopteris (L.) Tod.	HKr	MsT	Sc	MsTr	HgMs	Sil	RLD	+	–
Ophioglossaceae									
Botrychium lunaria (L.) Sw.	G	MgT	He	MsTr	Ms	Pr	RBU, RLD	+	–
Polypodiaceae									
Polypodium vulgare L.	HKr	MT	HeSc	MsTr	Ms	SilPt	RLD	+	–
Salviniaceae									
Salvinia natans (L.) All.	T	MsT	ScHe	MsTr	Pl	Aq	RBU, RLD	+	–
Thelypteridaceae									
Thelypteris palustris Schott	G	MT	HeSc	MsTr	Hg	SilPal	RLD	+	–
Divisio Pinophyta									
Pinaceae									
Pinus sylvestris L.	Ph	MsT	ScHe	OgMsTr	Ms	Sil	–	+	–
Divisio Magnoliophyta									
Class Liliopsida									
Alismataceae									
Alisma gramineum Ley.	HKr	MgT	He	MsTr	HelHg	PalAq	–	–	+
A. lanceolatum With.	HKr	MgT	He	MgTr	HelHg	PalAq	–	+	+
A. plantago-aquatica L.	HKr	MT	ScHe	MsTr	HgHel	PalAq	–	+	+
Sagittaria sagittifolia L.	HKr	MsT	ScHe	MsTr	HgHy	PalAq	–	+	+
Alliaceae									
Allium angulosum L.	G	MsT	ScHe	MsTr	HgMs	Pr	–	+	+
A. guttatum Stev.	G	MsT	He	OgMgTr	OgX	PsSt	RLD	–	+
A. oleraceum L.	G	MsT	ScHe	MsOgTr	XMs	RuStPrSil	–	+	+
A. waldschteinii G.Don fil.	***G***	***MgT***	He	MsTr	XMs	St	–	+	+
Araceae									
Acorus calamus L.	HKr	MgT	He	MsTr	HgHel	PalAq	RLD, Adv	+	+
Butomaceae									
Butomus umbellatus L.	HKr	MgT	He	MsTr	HgHel	PalAq	–	+	+
Convallariaceae									
Convallaria majalis L.	G	MgT	HeSc	MsTr	HgMs	Sil	RLD	+	–
Polygonatum multiflorum (L.) All.	G	MgT	Sc	MgTr	Ms	Sil	–	+	–
P. odoratum (Mill.) Druce	G	MsT	ScHe	OgTr	Ms	Sil	RLD	+	–
Cyperaceae									
Bolboschoenus compactus (Hoffm.) Drob.	HKr	MgT	He	AlkMsTr	HelHg	PrPal	–	+	+
B. maritimus (L.) Palla	HKr	MgT	He	AlkMgTr	HelHg	AqPal	–	+	+
Carex acuta L.	HKr	MgT	He	MsTr	HelHg	AqPal	–	+	+
C. acutiformis Ehrh.	HKr	MgT	ScHe	MsTr	Hg	SilPal	–	+	+
C. bohemica Schreb.	HKr	MsT	He	OgTr	MsHg	PrPs	RBU, RLD	+	+
C. bueckii Wimm.	HKr	MsT	He	AlkMgTr	HgMs	PalPr	RBU, RLD	+	+
C. caryophyllea Latourr.	HKr	MsT	He	OgTr	Ms	PrPs	–	+	+
C. caespitosa L.	HKr	MgT	ScHe	MsTr	MsHg	PrPal	–	+	–
C. distans L.	HKr	MgT	He	AlkMgTr	HgMs	PrHal	–	–	+
C. disticha Huds.	HKr	MgT	He	MsTr	HsMs	PalPr	–	+	+
C. elata All.	HKr	MgT	HSc	OgTr	MsHg	SilPal	RLD	+	–
C. hirta L.	HKr	MgT	ScHe	OgMsTr	HgMs	SilPr	–	+	+
C. lasiocarpa Ehrh.	HKr	MsT	ScHe	OgTr	MsHg	SilPal	RBU, RLD	+	–
C. lachenalii Schuhr	HKr	MgT	ScHe	MsTr	Ms	SilPr	–	+	–

1	2	3	4	5	6	7	8	9	10
C. limosa L.	HKr	MsT	He	MsTr	MsHg	Pal	–	+	+
C. melanostachya Bieb. ex Willd.	HKr	MsT	ScHe	AlkMgTr	Ms	PalPrSil	–	+	+
C. michelii Host	HKr	MgT	HeSc	MsTr	XMs	StSil	–	+	–
C. muricata L.	HKr	MgT	ScHe	MgTr	Ms	Sil	–	+	–
C. otrubae Podp.	HKr	MsT	ScHe	MgTr	HgMs	HalSilPr	–	+	+
C. praecox Schreb.	HKr	MgT	He	MgTr	XMs	StPr	–	+	+
C. pseudocyperus L.	HKr	MgT	HeSc	OgMsTr	Hg	SilPal	–	+	–
C. rhisina Blitt ex Lindbl.	HKr	MsT	Sc	MsTr	Ms	Sil	RLD	+	–
C. riparia Curtis	HKr	MgT	He	MsTr	Hg	Pal	–	+	+
C. spicata Huds.	HKr	MgT	HeSc	MgTr	XMs	PrSil	–	+	–
C. stenophylla Wahlenb.	HKr	MgT	He	AlkMgTr	MsX	PrSt	–	–	+
C. vesicaria L.	HKr	MsT	He	MsTr	MsHg	PrPal	–	+	+
C. vulpina L.	HKr	MgT	He	MsTr	MsHg	PalPr	–	+	+
Cyperus fuscus L.	T	MgT	He	OgMsTr	Hg	PsPal	–	+	+
Eleocharis acicularis (L.) Roem. et Schult.	HKr	MgT	ScHe	MsTr	HelHg	PrPal	RLD	+	–
E. mitracarpa Steud.	HKr	MgT	He	MgTr	Hg	PrPal	–	+	+
E. palustris (L.) Roem. et Schult.	HKr	MgT	He	MgTr	Hg	PrPal	–	+	+
Pycreus flavescens Reichenb.	T	MgT	He	MsOgTr	Hg	PsPal	–	+	+
Scirpoides holoschoenus (L.) Sojak.	G	MgT	He	OgTr	HgMs	PrPs	–	+	+
Scirpus lacustris L.	HKr	MgT	He	MsTr	HelHg	AqPal	–	+	+
S. supinus (L.) Palla	T	MgT	ScHe	MsTr	MsHg	PrPal	RLD	+	+
S. sylvaticus L.	HKr	MgT	HeSc	MsTr	Hg	SilPal	–	+	–
S. tabernaemontani C. C. Gmel.	HKr	MgT	He	AlkMsTr	Hg	Pal	–	+	+
Hyacintaceae									
Ornithogalum bouscheanum (Kunth) Aschers.	G	MgT	HeSc	MsTr	Ms	PrSil	RBU, RLD	+	–
O. fimbriatum Willd.	G	MgT	ScHe	MsTr	Ms	Sil	RLD	+	–
O. kochii Parl.	G	MgT	He	MsTr	MsX	SilPtSt	RLD	+	+
Scilla bifolia L.	G	MgT	ScHe	MsTr	XMs	StSil	RLD	+	–
S. sibirica Haw.	G	MgT	HeSc	MgTr	Ms	Sil	RLD	+	–
Hydrocharitaceae									
Elodea canadensis Michx.	Hd	EuT	HeSc	OgMsTr	Hy	RuAq	Adv	+	+
Hydrocharis morsus-ranae L.	Hd	MsT	ScHe	MsTr	Pl	Aq	–	+	+
Stratiotes aloides L.	Hd	MsT	ScHe	MsTr	Pl	Aq	RLD	+	+
Vallisneria spiralis L.	Hd	EuT	HeSc	MsTr	Hy	RuAq	Adv	+	+
Iridaceae									
Crocus reticulatus Stev. ex Adam.	G	MgT	He	AlkMsTr	MsX	PrSt	RBU, RLD	–	+
Gladiolus tenuis Bieb.	G	MgT	ScHe	MsTr	XMs	Pr	RBU, RLD	–	+
Iris halophila Pall.	HKr	MsT	He	AlkMsTr	XMs	HalPr	RLD	–	+
I. pseudacorus L.	G	MgT	He	MsTr	Hg	Pal	–	+	+
Juncaceae									
Juncus articulatus L.	HKr	MsT	He	OgMsTr	MsHg	PalPr	–	+	+
J. atratus Krook.	HKr	MsT	He	MgTr	HgMs	Pr	–	+	+
J. bufonius L.	T	MsT	ScHe	OgMsTr	MsHg	PsPr	–	+	+
J. compressus Jacq.	HKr	MgT	He	MgTr	MsHg	PalPr	–	+	+
J. effusus L.	Hel	MgT	He	MsTr	Hg	Pal	–	+	+
J. gerardii Loisel.	HKr	MgT	He	AlkMsTr	HgMs	HalPr	–	+	+
J. inflexus L.	HKr	MgT	He	MsTr	MsHg	Pr	–	–	+
J. tenageia Ehrh. ex L.fil.	T	MgT	He	OgTr	MsHg	PrPs	–	+	+
Lusula multiflora (Ehrh.) Lej.	HKr	MgT	ScHe	MsTr	Ms	SilPr	RLD	+	–
L. pallidula Krischner	HKr	MgT	ScHe	MsTr	Ms	SilPr	–	+	–
Juncaginaceae									
Triglochin maritimum L.	HKr	MgT	He	AlkTr	MsHg	PalHalPr	–	+	+
T. palustre L.	HKr	MgT	He	MgTr	MsHg	HalPalPr	–	+	+
Lemnaceae									
Lemna gibba L.	Hel	EuT	ScHe	MsTr	Pl	Aq	–	+	+
L. minor L.	Hel	EuT	ScHe	MsTr	Pl	Aq	–	+	+
L. trisulca L.	Hel	MsT	HeSc	MsTr	Hy	Aq	–	+	+
Spirodela polirrhyza (L.) Schleid.	Hel	EuT	He	MsTr	Pl	Aq	–	+	+
Wolffia arrhiza (L.) Horkel ex Wimm.	Hel	EuT	He	MsTr	Pl	Aq	RLD	+	+
Liliaceae									
Fritillaria meleagroides Patrin ex Schult. et Schult. f.	G	MsT	He	AlkMgTr	Ms	Pr	RBU, RLD	+	+
Fritillaria ruthenica WiXtr.	G	MsT	ScHe	MsTr	XMs	Sil	RBU, RLD	+	–
Gagea bulbifera (Pall.) Salisb.	G	MgT	He	MsTr	MsX	PtSt	–	+	+
G. erubscens (Bess.) Schult.et Schult.fil.	G	MsT	ScHe	MgTr	Ms	RuSil	–	+	+
G. lutea (L.) Ker-Gawl.	G	MgT	HeSc	MsTr	Ms	Sil	RLD	+	–
Tulipa quercetorum Klokov et Zoz	G	MsT	HeSc	MgTr	Ms	StSil	RBU, RLD	+	+
Najadaceae									
Caulinia minor (All.) Coss.et Germ.	T	EuT	HeSc	MsTr	Hy	Aq	RLD	+	+
Najas marina L.	T	MgT	HeSc	MsTr	Hy	Aq	–	+	+
Orchidaceae									
Dactylorhisa incarnata L.	G	MsT	He	MgTr	MsHg	PrPal	RBU, RLD	+	+
Anacamptis morio L.	G	MsT	He	MgTr	XMs	Pr	RBU, RLD	+	+
A. palustris (Jacq.) R.M. Bataman	G	MgT	He	AlkMsTr	MsHg	PrPal	RBU, RLD	–	+
Epipactis helleborine (L.) Crantz	G	MgT	ScHe	MsTr	Ms	PrSil	RBU, RLD	+	–
E. palustris (L.) Crantz	G	MgT	ScHe	OgMsTr	MsHg	PalPr	RBU, RLD	+	+
Liparis loeselii (L.) Rich.	G	MgT	He	OgMsTr	MsHg	PrPal	RBU, RLD	+	+
Listera ovata (L.) R. Borbas	G	MsT	HeSc	MsTr	Ms	Sil	RBU, RLD	+	–

1	2	3	4	5	6	7	8	9	10
Neottia nidus-avis (L.) Rich.	HKr	MsT	Sc	MsTr	Ms	Sil	RBU, RLD	+	–
Orchis militaris L.	G	MgT	HeSc	MsTr	Ms	SilPr	RBU, RLD	–	+
O. ustulata L.	G	MgT	ScHe	MgTr	Ms	SilPr	RBU, RLD	+	+
Platanthera bifolia (L.) Rich.	G	MgT	HeSc	MsTr	Ms	Sil	RBU, RLD	+	–
P. chlorantha (Cust.) Rchb.	G	MgT	HeSc	MsTr	Ms	Sil	RBU, RLD	+	–
Poaceae									
Agropyron lavrencoanum Procud.	HKr	MsT	He	OgTr	MsX	Ps	–	+	–
A. pectinatum (Bieb.) Beaux.	HKr	MgT	He	MsTr	X	St	–	–	+
Agrostis gigantea Roth	HKr	MsT	ScHe	MsTr	Ms	SilPr	–	+	–
A. stolonifera L.	HKr	MgT	ScHe	OgMsTr	Hg	PrPal	–	+	+
A. vinealis Schreb.	HKr	MsT	ScHe	OgTr	Ms	StSMnPs	–	+	–
Alopecurus aequalis Sobol.	T	MgT	He	OgTr	HgHel	PrPal	–	+	+
A. arundinaceus Poir.	G	MgT	He	AlkMgTr	HgMs	HalPalPr	–	+	+
A. geniculatus L.	T	MgT	He	OgTr	HgMs	PalPr	–	+	+
A. pratensis L.	HKr	MgT	He	MgTr	HgMs	Pr	–	+	+
Anisantha sterilis (L.) Nevski	T	MgT	ScHe	MsTr	MsX	PrStRu	Adv	+	+
A. tectorum (L.) Nevsli	T	MgT	ScHe	OgMgTr	MsX	PsRu	Adv	+	+
Anthoxantum odoratum L.	HKr	MsT	HeSc	OgTr	Ms	SilPr	RBU, RLD	+	+
Apera spica-venti (L.) Beauv.	T	MsT	ScHe	OgTr	XMs	RuPs	Adv	+	+
Arrhenatherum elatius (L.) J. et C. Presl	HKr	MgT	ScHe	MsTr	XMs	SilPr	–	+	+
Beckmania eruciformis (L.) Host.	HKr	MgT	ScHe	AlkMsTr	HgMs	PalPr	–	+	+
Brachypodium sylvaticum (Huds.) P. Beauv.	HKr	MgT	Sc	MgTr	Ms	Sil	–	+	–
Briza media L.	HKr	MgT	HeSc	MsTr	HgMs	SilPr	RLD	+	–
Bromopsis inermis (Leys.) Holub	G	MgT	He	OgMgTr	XMs	RuPrSt	–	+	+
B. riparia (Rehm.) Holub	G	MgT	He	OgTr	MsX	PrSt	–	+	+
B. arvensis L.	T	MgT	He	MsTr	XMs	Ru	Adv	+	+
B. commutatus Schrad	T	MgT	He	MsTr	XMs	Ru	Adv	+	+
B. hordeaceus L.	T	MgT	ScHe	MsTr	XMs	Ru	–	+	+
B. squarrosus L.	T	MgT	ScHe	OgMgTr	MsX	RuPsSt	Adv	+	+
Calamagrostis canescens (Web.) Roth	HKr	MgT	ScHe	MsTr	MsHg	SilPrPal	–	+	–
C. epigeios (L.)Roth	G	MgT	ScHe	OgMsTr	Ms	PsSilPr	–	+	+
Catabrosa aquatica (L.) Beauv.	HKr	MgT	He	MsTr	Hel	PrPal	–	+	+
Crypsis aculeata (L.) Ait.	T	MgT	He	AlkMsTr	HgMs	HalPr	RLD	–	+
C. schoenoides (L.) Lam.	T	MgT	He	AlkOgTr	Ms	HalPsPr	–	–	+
Cynodon dactylon (L.) Pers.	HKr	MgT	He	AlkMsTr	XMs	HalPr	Adv	–	+
Dactylis glomerata L.	HKr	MgT	ScHe	OgMsTr	Ms	SilPr	–	+	+
Digitaria sanguinalis (L.) Scop.	T	MsT	He	OgMsTr	Ms	PsRu	Adv	+	+
Echinochloa crusgalli (L.) Beauv.	T	MsT	He	OgMgTr	MsHg	Ru	Adv	+	+
Elymus caninus (L.) L.	HKr	MgT	HeSc	MgTr	Ms	Sil	–	+	–
Elytrigia intermedia (Host) Nevski	HKr	MgT	ScHe	OgMsTr	MsX	StPtPs	–	+	–
E. repens (L.) Nevski	G	MgT	ScHe	MsTr	Ms	SilStPrRu	–	+	+
E. trichophora (Link) Nevski	G	MgT	ScHe	MsTr	XMs	SilSt	–	+	+
Eragrostis minor Host	T	MgT	He	OgMsTr	MsX	PsRu	Adv	+	+
Festuca arietina Klokov	HKr	MsT	ScHe	OgTr	MsX	SilPs	–	+	–
F. beckeri (Hack) Trautv.	HKr	MgT	He	OgTr	X	StSilPs	–	+	+
F. gigantea (L.) Vill.	HKr	MgT	Sc	MgTr	HgMs	Sil	–	+	–
F. pratensis Huds.	HKr	MgT	ScHe	MsTr	HgMs	Pr	–	+	+
F. regeliana Pavl.	HKr	MgT	He	AlkTr	MsHg	HalPr	–	–	+
F. rupicola Heuff.	HKr	MgT	He	MgTr	XMs	PrSt	–	+	+
F. valesiaca Gaudin.	HKr	MgT	He	MgTr	X	St	–	+	+
Glyceria arundinacea Kunth	HKr	MgT	He	MsTr	HgHel	PrPal	–	+	+
G. fluitans (L.) R.Br.	HKr	MgT	He	MsTr	Hel	PalAq	–	+	+
G. maxima (C. Hartm.) Holub.	HKr	MgT	He	MsTr	HgHel	PalAq	–	+	+
G. notata Chevall.	HKr	MsT	He	MsTr	Hg	PrPal	–	+	+
Helictotrichon pubescens (Huds.) Pilg.	HKr	MgT	He	MsTr	XMs	StPr	RLD	+	–
Hierochloe odorata (L.) Beauv.	G	MgT	ScHe	OgMsTr	XMs	SilStPr	–	+	–
H. repens (Host) Beauv.	G	MsT	ScHe	OgMsTr	XMs	PsStPr	–	+	–
Koeleria delavignei Gern. ex Domin	HKr	MgT	He	AlkMsTr	XMs	PrSt	–	–	+
K. sabuletorum (Domin) Klokov	HKr	MgT	He	OgTr	MsX	PsSt	–	+	+
Leersia orizoides (L.) Sw.	G	MsT	HeSc	OgMsTr	HelHg	PrPal	RLD	+	+
Lolium perenne L.	HKr	MgT	He	MgTr	XMs	RuPr	–	+	+
Melica altissima L.	HKr	MgT	ScHe	MsTr	XMs	SMr	–	+	–
M. nutans L.	HKr	MgT	Sc	MsTr	Ms	Sil	RLD	+	–
M. picta C.Koch	HKr	MgT	ScHe	CaMsTr	XMs	Sil	–	+	–
M. transsilvanica Schur	HKr	MgT	ScHe	CaMsTr	MsX	SMnSt	–	+	+
Milium effusum L.	HKr	MgT	Sc	MgTr	Ms	Sil	–	+	–
Molinia caerulea (L.) Moench	HKr	MsT	ScHe	OgTr	Hg	SilPrPal	RLD	+	–
Nardus stricta L.	HKr	MgT	He	OgTr	Hg	SilPalPr	RLD	+	–
Phalaroides arundinacea (L.) Rauschert.	HKr	MgT	ScHe	MgTr	MsHg	PrPal	–	+	+
Phleum phleoides (L.) Karst.	HKr	MgT	He	MsTr	XMs	PrSt	–	+	+
Phragmites australis (Cav.) Trin.ex Steud.	HKr	EuT	ScHe	MsTr	Hel	PalAq	–	+	+
Poa angustifolia L.	HKr	MgT	ScHe	MsMgTr	MsX	SilPrSt	–	+	+
P. annua L.	T	EuT	HeSc	MsTr	Ms	RuSilPr	–	+	+
P. bulbosa L.	HKr	EuT	He	OgMsTr	MsX	RuSilSt	–	+	+
P. compressa L.	HKr	MgT	ScHe	OgMsTr	MsX	RuSt	–	–	+
P. nemoralis L.	HKr	MgT	ScHe	MsTr	XMs	Sil	–	+	–
P. palustris L.	HKr	MsT	He	MsTr	MsHg	PalPr	–	+	+

1	2	3	4	5	6	7	8	9	10
P. pratensis L.	G	MsT	He	MsTr	Ms	Pr	–	+	+
P. remota Forcelles	HKr	MsT	ScHe	MsTr	HgMs	Sil	RLD	+	–
P. sylvicola Guss.	HKr	MgT	HeSc	MgTr	HgMs	SilPalPr	–	+	–
P. trivialis L.	HKr	MsT	He	MsTr	HgMs	SilPalPr	–	+	–
Puccinella bilykiana Klokov	HKr	MsT	He	AlkTr	Ms	HalPr	–	–	+
P. distans (Jacq.) Parl.	HKr	MsT	He	AlkMsTr	XMs	RuHalPr	–	–	+
Scolochloa festucacea (Willd.) Link.	HKr	MsT	He	MsTr	Hg	Pal	RLD	+	+
Setaria glauca (L.) Beauv.	T	MgT	He	MsTr	XMs	PsRu	Adv	+	+
S. verticillata (L.) H. B.	T	MgT	ScHe	MgTr	Ms	Ru	Adv	+	+
S. viridis (L.)Beauv.	T	EuT	He	OgMsTr	XMs	PsRu	Adv	+	+
Potamogetonaceae									
Potamogeton berchtoldii Fieb.	HKr	MsT	HeSc	MsTr	Hy	Aq	–	+	+
P. compressus L.	HKr	MsT	HeSc	MsTr	Hy	Aq	–	+	–
P. crispus L.	HKr	EuT	HeSc	MsTr	Hy	Aq	–	+	+
P. gramineus L.	HKr	MgT	ScHe	MsTr	PlHy	Aq	–	+	+
P. lucens L.	HKr	MgT	HeSc	MsTr	Hy	Aq	–	+	–
P. natans L.	HKr	MsT	ScHe	MsTr	Pl	Aq	RLD	+	–
P. nodosus Poir.	HKr	MgT	ScHe	MsTr	Hy	Aq	RLD	+	–
P. pectinatus L.	HKr	EuT	HeSc	MsTr	Hy	Aq	–	+	+
P. perfoliatus L.	HKr	MgT	HeSc	MsTr	Hy	Aq	–	+	+
P. sarmaticus Maemets	HKr	MsT	HeSc	MsTr	Hy	Aq	RLD	+	–
Sparganiaceae									
Sparganium erectum L.	HKr	MgT	He	MsTr	Hel	PalAq	–	+	+
S. minimum Wallr.	HKr	MsT	HeSc	MsTr	Hel	PalAq	RLD	+	+
Typhaceae									
Typha angustifolia L.	HKr	EuT	He	MsTr	Hel	PalAq	–	+	+
T. latifolia L.	HKr	MsT	He	MgTr	Hel	PalAq	–	+	+
T. laxmannii Lepech.	HKr	MsT	He	AlkMsTr	Hel	PalAq	–	+	+
Zannicheliaceae									
Zannichelia palustris L.	HKr	MgT	HeSc	AlkMsTr	Hy	Aq	RLD	–	+
Кlас Magnoliopsida									
Aceraceae									
Acer campestre L.	Ph	MgT	ScHe	MgMsTr	XMs	SMnSil	–	+	–
A. negundo L.	Ph	MsT	He	MsTr	Ms	SilCuRu	Adv	+	+
A. platanoides L.	Ph	MsT	HeSc	MgMsTr	Ms	Sil	–	+	–
A. tataricum L.	Ph	MsT	ScHe	AlkMsTr	Ms	SilSMn	–	+	+
Adoxaceae									
Adoxa moschatellina L.	HKr	MsT	HeSc	MsTr	Ms	Sil	RLD	+	–
Amaranthaceae									
Amaranthus albus L.	T	MsT	He	MsTr	MsX	Ru	Adv	+	+
A. blitoides S.Wats.	T	MgT	He	MsTr	MsX	Ru	Adv	+	+
A. caudatus L.	T	MgT	He	MgTr	XMs	CuRu	Adv	+	+
A. retroflexus L.	T	MsT	He	MsTr	MsX	Ru	Adv	+	+
Apiaceae									
Aegopodium podagraria L.	G	MsT	HeSc	MgTr	Ms	Sil	–	+	–
Aethusa cynapium L.	THKr	MgT	ScHe	MsTr	XMs	SilRu	Adv	+	–
Antriscus cerefolium (L.) Hoffm.	T	MgT	HeSc	MsTr	XMs	SilRu	–	+	–
Antriscus sylvestris (L.) Hoffm.	HKr	MsT	HeSc	MsTr	Ms	RuSil	–	+	+
Chaerophyllum bulbosum L.	HKr	MsT	ScHe	OgTr	Ms	PrSil	–	+	–
Chaerophyllum temulum L.	THKr	MsT	HeSc	MsTr	Ms	RuSil	–	+	–
Cicuta virosa L.	Hel	MsT	HeSc	MsTr	Hg	Pal	–	+	–
Conium maculatum L.	HKr	MgT	He	MsTr	Ms	Ru	–	+	–
Daucus carota L.	HKrT	MgT	ScHe	MsTr	XMs	Ru	–	+	+
Eryngium campestre L.	G	MgT	He	MsTr	X	RuSt	–	+	+
E. planum L.	HKr	MgT	ScHe	Og-MsTr	XMs	StPr	–	+	+
Heracleum sibiricum L.	HKr	MsT	ScHe	MsTr	Ms	SilPr	–	+	+
Laser trilobum (L.) Borkh.	HKr	MgT	ScHe	MsTr	Ms	Sil	RLD	+	–
Oenanthe aquatica (L.) Poir.	HKr	MsT	ScHe	MsTr	Hg	Pal	–	+	+
Pastinaca sylvestris Mill.	HKr	MsT	ScHe	MsTr	Ms	SilPr	–	+	+
Peucedanum latifolium (Bieb.) DC.	HKr	MgT	He	AlkTr	Ms	PrH	–	–	+
P. lubimencoanum Kotov	HKr	MgT	HeSc	MsTr	XMs	SMn	–	+	–
P. palustre (L.) Moench	HKr	MsT	He	MgTr	MsHg	PrPal	RLD	+	+
Siella erecta (Huds.) M. Pimen.	HKr	MsT	He	OgTr	Hg	Pal	RLD	+	+
Sium latifolium L.	HKr	MsT	ScHe	MsTr	Hg	Pal	–	+	+
S. sisaroideum DC.	HKr	MgT	He	MsTr	Hg	Pal	–	+	+
Torilis japonijca (Houtt.) DC.	T	MgT	ScHe	MsTr	XMs	RuSil	–	+	+
Aristolochiaceae									
Aristolochia clematitis L.	G	MgT	HeSc	MsTr	HgMs	RuPrSil	–	+	+
Asarum europaeum L.	G	MsT	Sc	MgTr	Ms	Sil	RLD	+	–
Asclepiadaceae									
Asclepias syriaca L.	G	MgT	He	MsTr	XMs	Ru	Adv	–	+
Vincetoxicum hirundinaria Medik.	HKr	MgT	ScHe	MsTr	MsX	StSMnSil	–	+	+
Asteraceae									
Achillea setacea Waldst.et Kit.	HKr	MsT	ScHe	MsTr	X	StSilSMn	–	+	+
A. submillefolium Klok. et Krytzka	HKr	MsT	ScHe	MsTr	XMs	SilSMnPrSt	–	+	+
Ambrosia artemisifolia L.	T	MsT	ScHe	OgMgTr	X	Ru	Adv	+	+
Anthemis cotula L.	T	MgT	He	MsTr	XMs	Ru	Adv	+	+

1	2	3	4	5	6	7	8	9	10
Arctium lappa L.	HKr	MsT	ScHe	MgTr	Ms	SilRu	–	+	+
A. nemorosum Lej.	HKr	MsT	HeSc	MgTr	Ms	RuSil	–	+	–
A. tomentosum Mill.	HKr	MsT	He	MgTr	Ms	Ru	–	+	+
Artemisia abrotanum L.	Ch	MsT	He	OgMsTr	HgMs	PalPr	–	+	+
A. absinthium L.	HKr	MsT	He	MsTr	XMs	Ru	Adv	+	+
A. austriaca Jacq.	Ch	MsT	He	MsTr	X	RuSt	–	+	+
A. campestris L.	HKr	MsT	He	OgMsTr	X	SilPsSt	–	+	+
A. pontica L.	HKr	MsT	ScHe	MsTr	X	SilSMnSt	RLD	+	+
A. vulgaris L.	HKr	MsT	ScHe	MgTr	Ms	PrRu	–	+	+
Bidens tripartita L.	T	EuT	ScHe	MsTr	HgMs	PalPr	–	+	+
Carduus acanthoides L.	T HKr	MsT	He	MsTr	MsX	PrStRu	–	+	+
C. crispus L.	HKr	MsT	ScHe	MsTr	Ms	SilRu	–	+	–
C. uncinatus M. Bieb.	HKr	MsT	He	MgTr	MsX	RuSt	–	–	+
Centaurea diffusa Lam.	HKr	MgT	He	MsTr	X	StRu	Adv	–	+
C. jacea L.	HKr	MsT	ScHe	MgTr	Ms	Pr	–	+	+
C. scabiosa L.	HKr	MsT	ScHe	MgTr	MsX	StRu	–	+	+
C. substituta Czerep.	HKr	MsT	ScHe	MsTr	Ms	SilPr	RLD	+	+
C. trichocephala Bieb.	HKr	MgT	ScHe	MsTr	XMs	PrSt	–	+	+
Chartolepis intermedia Boiss.	G	MgT	He	AlkTr	Ms	PrHal	–	–	+
Cichorium inthybus L.	HKr	MsT	He	MsTr	MsX	RuStPr	Adv	+	+
Cirsium alatum (S.B.Gmel.)Bobr.	HKr	MsT	He	AlkTr	Ms	PrHal	RLD	+	+
C. polonicum (Petrak) Iljin	HKr	MsT	He	MsTr	MsX	StRu	–	–	+
C. rivulare (Jacq.) All.	HKr	MsT	He	MsTr	MsHg	PalPr	RLD	+	+
C. setosum (Willd.) Bess.	G	MgT	He	MsTr	MsX	Ru	–	+	+
C.ucrainicum Bess.	HKr	MsT	He	OgMsTr	X	RuSt	–	–	+
C. vulgare (Savit) Ten.	HKr	MgT	ScHe	MgTr	XMs	Ru	–	+	+
Coniza canadensis (L.) Cronq.	T HKr	EuT	ScHe	OgMgTr	MsX	Ru	Adv	+	+
Crepis rhoedifolia M.Bieb.	T	MgT	He	MsTr	MsX	StRu	–	–	+
C. setosa Hal.	T	MsT	He	MsTr	MsX	PrRu	–	+	+
C. tectorum L.	T HKr	MsT	He	OgMsTr	MsX	PsStRu	–	+	+
Echinops ruthenicus M. Bieb.	HKr	MsT	ScHe	MgTr	X	PtSt	–	–	+
E. sphaerocephalus L.	HKr	MsT	ScHe	MsTr	X	SMnSt	–	+	+
Erigeron acris L.	HKr	MsT	ScHe	MsTr	MsX	RuPrSt	–	–	+
Eupatorium cannabinum L.	HKr	EuT	ScHe	MgTr	HgMs	SilPr	–	+	–
Filago arvensis L.	T	MgT	ScHe	OgMsTr	MsX	SilStRu	–	–	+
Galinsoga parviflora Cav.	T	MgT	ScHe	MsTr	Ms	Ru	Adv	+	+
Gnaphalium uliginosum L.	T	MsT	He	MsTr	MsHg	PrPal	RLD	+	–
Hieracium umbellatum L.	HKr	MsT	ScHe	OgTr	MsX	StPs	RLD	+	+
Hypochaeris maculata L.	HKr	MsT	ScHe	MsTr	Ms	SilPr	–	+	–
Inula britanica L.	HKr	MgT	He	MsTr	Ms	RuPr	–	+	+
I. germanica L.	G	MgT	He	MgTr	XMs	StPr	–	–	+
I. helenium L.	HKr	MgT	He	MgTr	HgMs	Pr	RLD	–	+
I. hirta L	HKr	MsT	ScHe	MgTr	MsX	PrSilSt	RLD	+	+
I. salicina L.	G	MgT	ScHe	OgTr	XMs	PrSMn	–	+	+
Iva xanthiifolia Nutt.	T	MsT	ScHe	OgMgTr	XMs	Ru	Adv	+	+
Lactuca chaixii Vill.	T	MsT	HeSc	MgTr	Ms	Sil	–	+	–
L. serriola Torner	T HKr	MgT	He	MsTr	XMs	Ru	Adv	+	+
L. quercina L.	HKr	MsT	HeSc	MsTr	Ms	Sil	RLD	+	–
L. tatarica (L.) C. A. Mey.	G	MgT	He	MsTr	XMs	HalRu	–	+	+
Lapsana communis L.	T	MgT	HeSc	MgTr	XMs	RuSil	–	+	–
Leontodon autumnalis L.	HKr	MsT	ScHe	MsTr	Ms	RuPr	–	–	+
Lepidotheca suaveolens (Pursh) Nutt.	T	EuT	He	MsTr	MsX	Ru	Adv	+	+
Matricaria recutita L.	T	MsT	He	MsTr	MsX	Ru	Adv	+	+
Onopordum acanthium L.	HKr	MsT	He	MsTr	MsX	Ru	Adv	–	+
Petasites spurius (Retz.) Rchb.	G	MsT	ScHe	OgTr	MsHg	Ps	Adv	+	+
Phalacrochena inuloides (Fisch.ex Shmalh.) Iljin	G	MsT	He	AlkMgTr	XMs	RuHalPr	RLD	–	+
Phalacroloma annuum (L.) Dumort.	T HKr	MsT	ScHe	MsTr	MsX	Ru	Adv	+	+
Picris hieracioides L.	HKr	EuT	He	MsTr	MsX	RuSt	–	+	+
Pilosella caespitosa (Dumort.) P.D.Seli et West	HKr	MsT	He	MgTr	Ms	SMnPr	–	+	+
Ptarmica salicifolia (Besser) Serg.	HKr	MsT	He	OgMsTr	MsHg	PalPr	–	+	+
Pyrethrum corymbosum (L.) Scop.	HKr	MsT	ScHe	MgTr	XMs	PrSil	RLD	+	–
Rhaponticum serratuloides (Georgi) Bobr.	HKr	MgT	He	AlkTr	MsHg	HalPr	RLD	–	+
Scorzonera laciniata L.	HKr	MgT	He	AlkTr	XMs	HalStPr	–	+	+
S. parviflora Jacq.	HKr	MsT	He	AlkTr	Ms	HalPr	–	–	+
Senecio erucifolius L.	HKr	MsT	He	AlkMsTr	XMs	StHalPr	–	–	+
S. grandidentatus Ledeb.	HKr	MgT	ScHe	AlkOgMsTr	XMs	StPsHalPr	–	–	+
Senecio jacobaea L.	HKr	MsT	He	MsTr	MsX	RuSMnPrSt	–	+	+
S. paucifolius S.G. Gmel.	HKr	MgT	He	AlkTr	XMs	HalPr	RLD	–	+
Serratula coronata L.	HKr	MgT	ScHe	MsTr	Ms	SMnPr	–	+	+
S. lycopifolia (Vill.) A. Kerner	HKr	MgT	ScHe	MgTr	MsX	StPrSMn	–	+	+
Sonchus arvensis L.	G	EuT	He	MgTr	Ms	PrRu	Adv	+	+
S. palustris L.	HKr	MsT	He	MsTr	MsHg	Pal	–	+	–
Tanacetum vulgare L.	HKr	MsT	He	OgMgTr	MsX	StRuPr	–	+	+
Taraxacum officinale Wigg. aggr.	HKr	EuT	ScHe	MsTr	Ms	RuPr	–	+	+
Tragopogon major Jacq.	HKr	MsT	He	MsTr	MsX	SMnRuSt	–	+	+
Tragopogon orientalis L.	HKr	MgT	He	MgTr	X	St	RLD	+	+
Tripleurospermum inodorum (L.) Sch.	T HKr	MgT	He	MgTr	MsX	Ru	Adv	+	+

1	2	3	4	5	6	7	8	9	10
Tussilago farfara L.	G	MsT	He	MsTr	MsHg	RuPr	–	+	+
Xantium californicum Greene	T	MsT	He	MsTr	Ms	Ru	Adv	+	+
X. spinosum L.	T	MsT	He	MsTr	Ms	Ru	Adv	–	+
X. strumarium L.	T	MsT	He	MsTr	Ms	Ru	Adv	+	+
Balsaminaceae									
Impatiens noli-tangere L.	T	MsT	HeSc	MsTr	HgMs	PalSil	RLD	+	–
Betulaceae									
Alnus glutinosa (L.) Gaerthn.	Ph	MgT	ScHe	MgTr	Hg	PalSil	RLD	+	–
Boraginaceae									
Aegonychon purpureocaeruleum (L.) Holub	HKr	MgT	HeSc	MsMgTr	Ms	Sil	RLD	+	–
Asperugo procumbens L.	T	MgT	ScHe	MsTr	XMs	Ru	–	+	+
Buglossoides arvensis (L.) I.M. Johnst.	T HKr	MgT	ScHe	MsTr	MsX	Ru	Adv	+	+
Cynoglossum officinale L.	G	MgT	He	OgTr	XMs	Ru	Adv	–	+
Echium vulgare L.	HKr	MgT	He	MsTr	X	PsStRu	–	–	+
Lithospermum officinale L.	T	MsT	He	MsTr	X	RuStPt	–	–	+
Lycopsis arvensis L.	T	MsT	He	MsTr	X	RuPt	–	–	+
Myosotis laxa Lehm.	T HKr	MgT	ScHe	MsTr	MsHg	PrPal	–	+	+
M. micrantha Pall.ex Lehm.	HKr	MgT	He	MsTr	MsX	SMnRuPsSt	–	+	+
M. nemorosa Besser	HKr	MsT	ScHe	MsTr	MsHg	PalSil	–	+	–
M. scorpioides L.	HKr	MT	ScHe	MsTr	Hg	PrPal	–	+	+
M. sparsiflora J.C. Mikan ex Pohl	T HKr	MgT	ScHe	MsTr	MsX	RuSil	–	+	–
Omphalodes scorpioides (Haenke) Schrank	T	MsT	HeSc	MgTr	Ms	SilRu	RLD	+	–
Pulmonaria obscura Dumort.	HKr	MsT	HeSc	MsTr	Ms	Sil	–	+	–
Symphytum officinale L.	HKr	MgT	ScHe	MgTr	MsHg	PalPr	–	+	+
S. tauricum Willd.	HKr	MgT	HeSc	MsTr	XMs	Sil	RLD	+	–
Brassicaceae									
Alliaria petiolata (Bieb.) Cavara et Grande	HKr	MgT	HeSc	MsTr	XMs	RuSil	–	+	–
Alyssum desertorum Stapf.	T	MgT	He	MsTr	MsX	RuSt	–	+	+
Arabidopsis thaliana (L.) Heynh.	HKr	MgT	He	OgTr	XMs	PsRu	Adv	+	+
A. toxophylla (Bieb.) N.Busch.	HKr	MgT	He	AlkMgTr	HgMs	HPr	–	–	+
Arabis pendula L.	HKr	MgT	HeSc	MgTr	Ms	RuSil	–	+	–
Barbarea stricta Andrz.	T HKr	MgT	ScHe	MgTr	HgMs	PalPr	–	+	–
Barbarea vulgaris R.Br.	HKr	MsT	ScHe	MsMgTr	Ms	PrRu	–	–	+
Berteroa incana (L.) DC.	HKr	MgT	ScHe	Og-MgTr	XMs	Ru	–	+	+
Brassica campestris L.	T	MsT	ScHe	MsTr	XMs	Ru	Adv	–	+
Bunias orientalis L.	T HKr	MsT	ScHe	OgMgTr	XMs	Ru	Adv	+	+
Camelina microcarpa Andrcz.	T	MsT	He	MsTr	XMs	SilRu	Adv	+	+
Capsella bursa-pastoris (L.) Medik.	T	MsT	He	MsTr	XMs	Ru	Adv	+	+
Cardamine amara L.	HKr	MsT	ScHe	MsTr	MsHg	SilPal	–	+	–
C. impatiens L.	T HKr	MgT	HeSc	MsTr	HgMs	PalSil	–	+	–
C. parviflora L.	T	MgT	ScHe	MsTr	HgMs	PalPsPr	–	+	+
Cardaria draba (L.) Desv.	G	MgT	He	MsTr	MsX	Ru	Adv	+	+
Chorispora tenella (Pall.) DC.	T	MgT	He	MsTr	MsX	Ru	Adv	+	+
Descurainia sophia (L.) Webb et Plantl	T	MgT	He	MsTr	XMs	Ru	Adv	+	+
Diplotaxis muralis (L.) DC.	T HKr	MsT	He	MsTr	MsX	PtRu	Adv	+	+
D. tenuifolia (L.) DC.	HKr Ch	MsT	He	MsTr	MsX	Ru	Adv	–	+
Draba nemorosa L.	T	MsT	He	MsTr	XMs	Ru	–	+	+
Erophila verna (L.) Bess.	T	MgT	He	OgMsTr	XMs	RuPsSt	–	+	+
Erysimum cheiranthoides L.	HKr	MT	He	MsTr	Ms	Ru	Adv	+	+
E. diffusum Ehrh.	HKr	MgT	He	MsTr	X	RuSt	–	–	+
E. strictum P. Gaertn.	HKr	MgT	ScHe	MsTr	MsX	RuSt	–	+	–
Euclidium syriacum (L.) R.Br.	T	MgT	He	MsTr	X	Ru	Adv	–	+
Hesperis sibirica L.	HKr	MgT	HeSc	MsMgTr	Ms	Sil	Adv	+	–
Lepidium latifolium L.	HKr	MsT	He	AlkMsTr	XMs	PrH	–	+	+
L. ruderale L.	T HKr	MT	He	AlkMsTr	MsX	Ru	Adv	–	+
Rorippa amphibia (L.) Bess.	G	MgT	HeSc	MgTr	HyHg	AqPal	–	+	–
Sisymbrium loeselii L.	T HKr	MgT	He	OgMsTr	MsX	Ru	Adv	+	+
S. officinale (L.) Scop.	T HKr	MsT	He	MsTr	MsX	Ru	–	–	+
Thlaspi arvense L.	T	MgT	He	MsTr	MsX	Ru	Adv	+	+
T. perfoliatum L.	T	MsT	He	MsTr	XMs	PrStRu	Adv	–	+
Turritis glabra L.	T HKr	MsT	ScHe	MsTr	Ms	RuSMn	–	+	+
Caesalpiniaceae									
Gleditschia triacanthos L.	Ph	MsT	He	MsTr	MsX	SilCu	Adv	+	–
Callitrichaceae									
Callitriche cophocarpa Sendtner	T	MT	ScHe	MsMgTr	Hy	PalAq	–	+	–
C. palustris L.	T	EuT	ScHe	MsMgTr	Hy	AqPal	RLD	+	–
Campanulaceae									
Campanula glomerata L.	HKr	MsT	ScHe	MsTr	XMs	StPrSil	RLD	+	+
C. patula L.	HKr	MsT	ScHe	MsTr	XMs	SilPr	–	+	–
C. persicifolia L.	HKr	MsT	HeSc	MsTr	Ms	PsSil	RLD	+	–
C. rapunculoides L.	HKr	MsT	ScHe	MsTr	XMs	StPrSil	–	+	+
C. rapunculus L.	HKr	MgT	ScHe	MsTr	Ms	SMnPr	–	+	+
C. trachelium L.	HKr	MsT	HeSc	MsTr	Ms	SMnSil	RLD	+	–
Cannabaceae									
Humulus lupulus L.	G	MsT	HeSc	MsTr	HgMs	RuSil	–	+	+

1	2	3	4	5	6	7	8	9	10
Caprifoliaceae									
Lonicera tatarica L.	nPh	MgT	ScHe	MsTr	MsX	SMnCu	Adv	+	+
Sambucus nigra L.	nPh	MgT	ScHe	MgMsTr	Ms	RuSil	–	+	+
Viburnum opulus L.	nPh	MgT	ScHe	MgMsTr	Ms	PtSil	–	+	–
Caryophyllaceae									
Cerastium holosteoides Fries.	HKr	EuT	ScHe	MgMsTr	Ms	SMnPr	–	+	–
C. nemorale Bieb.	T	MgT	ScHe	MsTr	Ms	PrSil	–	+	–
Coccyganthe flos-cuculi (L.) Four.	HKr	MgT	ScHe	MsTr	MsHg	SMnPalPr	RLD	+	+
Cucubalus baccifer L.	HKr	MgT	HeSc	MgTr	HgMs	PrSil	–	+	–
Dianthus platyodon Klokov	HKr	MsT	He	OgTr	MsX	SilPs	–	+	+
Elisanthe noctiflora (L.) Rupr.	HKr	MgT	ScHe	MsTr	XMs	SMnPr	–	+	–
Herniaria glabra L.	T	MsT	He	MsTr	MsX	RuSt	–	+	+
Holosteum umbellatum L.	T	MgT	He	OgMsTr	XMs	RuPtSt	–	+	+
Melandrium album (Mill.) Garcke	HKr	MgT	ScHe	MsTr	MsX	RuSMnPr	–	+	+
Moeringia trinervia (L.) Clairv.	THKr	MgT	HeSc	OgMsTr	HgMs	Sil	–	+	+
Myosoton aquaticum (L.) Moench	HKr	MgT	ScHe	Og-MsTr	HgMs	PalPr	–	+	+
Oberna behen (L.) Ikonn.	HKrCh	MgT	ScHe	MsTr	XMs	RuSMnPr	–	+	+
Psammophiliella muralis (L.) Ikonn.	T	MgT	He	MsTr	Ms	RuPrSt	–	–	+
Sagina procumbens L.	ChHKr	MsT	ScHe	MsMgTr	HgMs	SMnPr	–	+	+
Saponaria officinalis L.	HKr	MgT	ScHe	OgMsTr	Ms	RuSMnPr	Adv	+	+
Silene chlorantha (Willd.) Ehrh.	HKr	MgT	ScHe	OgMsTr	XMs	PsSilSt	–	+	+
S. dichotoma Ehrh.	THKr	MsT	He	MsTr	XMs	StRu	–	–	+
Stellaria graminea L.	HKr	MsT	ScHe	OgMsTr	Ms	SMnPr	–	+	–
S. holostea L.	ChHKr	MgT	HeSc	MsTr	Ms	Sil	–	+	–
S. media (L.) Vill.	THKr	MsT	ScHe	MsMgTr	HgMs	SilRu	–	+	+
S. neglecta Weihe	THKr	MgT	ScHe	MgMsTr	HgMs	RuSil	–	+	–
S. nemorum L.	HKr	MsT	HeSc	MsTr	HgMs	Sil	RLD	+	–
S. palustris Retz.	HKr	MsT	He	MsMgTr	Hg	PalPr	RLD	+	–
Celastraceae									
Euonymus europaea L.	nPh	MgT	HeSc	MsTr	Ms	SMnSil	–	+	–
E. verrucosa Scop.	nPh	MgT	HeSc	MsTr	Ms	SMnSil	–	+	–
Ceratophyllaceae									
Ceratophyllum demersum L.	HKr	EuT	Sc	AlkMgTr	Hy	Aq	–	+	+
C. pentacanthum Haynald	HKr	MsT	Sc	MgTr	Hy	Aq	RLD	+	–
C. submersum L.	HKr	MgT	Sc	MgTr	Hy	Aq	–	+	–
C. tanaiticum Sapjeg.	HKr	MsT	HeSc	MgTr	Hy	Aq	RLD	+	–
Chenopodiaceae									
Atriplex patula L.	T	MgT	He	MsTr	XMs	Ru	–	–	+
A. prostrata Boucher	T	MsT	ScHe	AlkMsTr	XMs	RuHalPr	Adv	+	+
A. rosea L.	T	MgT	He	MsTr	XMs	CrRu	–	–	+
A. sagittata Borkh	T	MgT	He	AlkMsTr	MsHg	RuHalPr	Adv	+	+
A. tatarica L.	T	MgT	He	MsTr	MsX	RuHal	Adv	+	+
Ceratocarpus arenarius L.	T	MgT	ScHe	OgMsTr	MsX	RuStPs	–	–	+
Chenopodium album L.	T	EuT	ScHe	MsTr	MsX	Ru	–	+	+
C. glaucum L.	T	MgT	He	AlkTr	MsHg	PrRuHal	–	+	+
C. hybridum L.	T	MgT	HeSc	MsTr	XMs	SilRu	Adv	+	–
C. polyspermum L.	T	MsT	HeSc	OgMsTr	XMs	RuSMnPs	Adv	+	+
C. rubrum L.	T	MgT	ScHe	MsTr	HgMs	RuPs	Adv	+	+
C. urbicum L.	T	MsT	He	MsTr	Ms	Ru	–	+	+
Clusiaceae									
Hypericum hirsutum L.	HKr	MgT	HeSc	MgTr	XMs	SMnSil	–	+	–
H. perforatum L.	HKr	MgT	ScHe	OgMsTr	Ms	SMnPr	–	+	+
Convolvulaceae									
Calystegia sepium (L.) R. Br.	HKr	EuT	ScHe	MsTr	MsHg	PrPal	–	+	–
Convolvulus arvensis L.	G	EuT	ScHe	MsTr	MsX	Ru	–	+	+
Cornaceae									
Swida sanquinea (L.) Opiz.	Ph	MsT	HeSc	MsTr	Ms	Sil	–	+	–
Corylaceae									
Corylus avellana L.	Ph	MgT	HeSc	MsTr	Ms	Sil	–	+	–
Cuscutaceae									
Cuscuta europaea L.	T	MgT	He	Par	HgMs	PrSil	–	+	+
Cuscuta lupuliformis Krock.	T	MgT	He	Par	Ms	SilRu	–	+	+
Dipsacaceae									
Dipsacus strigosus Willd. ex Roem	HKr	MgT	HeSc	MgTr	HgMs	RuSil	–	+	–
Knautia arvensis (L.) Coult.	HKr	MgT	He	MsTr	XMs	PrSMn	–	+	+
Scabiosa ucrainica L.	HKr	MsT	He	OgTr	MsX	StPtPs	–	+	–
Elaeagnaceae									
Elaeagnus angustifolia L.	Ph	MgT	He	AlkMsTr	Ms	SMnPrRu	Adv	+	+
Elatinaceae									
Elatine alsinastrum L.	T	MgT	ScHe	MsTr	Hd	PalAq	RLD	+	–
Euphorbiaceae									
Euphorbia kaleniczenkoi Czern.	HKr	MsT	He	MgTr	MsX	RuStPr	–	+	+
E. palustris L.	HKr	MsT	He	MgTr	MsHg	PalPr	–	+	+
E. seguieriana Nesk.	HKr	MgT	He	MsOgTr	MsX	PtStPs	–	+	+
E. semivillosa Prokh.	HKr	MgT	ScHe	MsTr	Ms	PrSMn	–	+	+
E. virgata Wald. et Kit.	HKr	MsT	ScHe	MsTr	Ms	RuPr	–	+	+

1	2	3	4	5	6	7	8	9	10
Fabaceae									
Amorpha fruticosa L.	nPh	MsT	ScHe	OgMsTr	HgMs	CuRuSil	Adv	+	+
Astragalus ausriacus Jacq.	HKr	MgT	ScHe	OgMsTr	X	PtSt	–	–	+
A. cicer L.	HKr	MgT	ScHe	MsTr	XMs	RuStPr	–	+	+
A. glycyphyllos L.	HKr	MgT	HeSc	MgTr	Ms	Sil	–	+	–
Caragana arborescens L.	Ph	MsT	He	MsTr	MsX	CuSil	–	+	–
Chamecytisus lindemanii (V.Krecz.) Klaskova	Ch	MsT	ScHe	MsTr	XMs	SMnSt	ERL, RLD	+	+
Genista tinctoria L.	nPh	MsT	ScHe	MsOgTr	XMs	PrPsSMn	–	+	–
Lathyrus incurvus (Roth) Roth	G	MgT	He	AlkMsTr	XMs	HalPr	RLD	+	+
L. palustris L.	HKr	MgT	He	MsMgT	MsHg	PalPr	RLD	+	–
L. pratensis L.	GHKr	MgT	He	MgTr	Ms	SMnPr	–	–	+
L. sylvestris L.	HKr	MgT	ScHe	MsTr	Ms	SilSMn	–	+	–
L. tuberosus L.	G	MgT	He	MsMgTr	MsX	RuPrSt	Adv	+	+
L. vernus (L.) Bernh.	G	MsT	HeSc	MsTr	Ms	SilSMn	RLD	+	–
Lotus praetermissus Kuprian.	T	MgT	He	OgTr	Ms	Ps	–	+	+
L. ucrainicus Klokov	HKr	MsT	He	MgMsTr	XMs	StPr	–	+	+
Medicago lupulina L.	THKr	MgT	He	MsMgTr	Ms	RuSMnPr	–	+	+
M. romanica Prod.	HKr	MgT	He	MsTr	MsX	PrPtSt	–	+	+
Melilotus albus Medik.	HKr	MgT	He	MsTr	MsX	RuPrSt	–	–	+
M. officinalis (L.) Pall.	HKr	EuT	He	MsTr	XMs	RuStPr	–	–	+
Ononis arvensis L.	HKr	MgT	He	AlkMgTr	Ms	HalPr	–	–	+
Robinia pseudoacacia L.	Ph	MsT	He	Og-MgTr	X-Ms	CuSil	Adv	+	+
Securigera varia L.	HKr	MgT	He	MsTr	XMs	StSMnPr	–	+	+
Trifolium alpestre L.	HKr	MgT	He	MgTr	XMs	SilStPr	–	+	+
T. ambiguum Bieb.	HKr	MgT	He	MgTr	Ms	RuHalPr	–	–	+
T. aureum L.	T	MgT	ScHe	MsTr	Ms	SMnPr	–	+	+
T. borysthenicum Grun.	HKr	MgT	He	AlkMsTr	Ms	HalPr	–	–	+
T. fragiferum L.	HKr	MgT	He	AlkTr	HgMs	HalPr	–	–	+
T. medium L.	G	MgT	ScHe	MgTr	Ms	SilPr	–	+	–
T. montanum L.	HKr	MgT	HeSc	MgTr	XMs	SMnPr	–	+	–
T. pratense L.	HKr	MgT	He	MgTr	HgMs	RuSMnPr	–	+	+
T. repens L.	HKr	MT	He	MgTr	HgMs	RuPr	–	+	+
Trigonella caerulea (L.) Ser.	T	MgT	He	MsTr	Ms	RuPr	Adv	–	+
Vicia angustifolia Reichard	T	MgT	He	MsMgTr	XMs	RuPr	Adv	–	+
V. cracca L.	HKr	MsT	He	MsTr	HgMs	PrSt	–	+	+
V. dasycarpa Ten.	HKr	MgT	He	MsTr	XMs	SilPr	–	+	+
V. grandiflora Scop.	HKr	MsT	He	MsTr	Ms	SMnPr	–	+	+
V. hirsuta (L.) S.F.Grag	T	MgT	ScHe	MsTr	MsX	RuSilSt	Adv	+	+
V. picta Fisch. et Mey.	HKr	MgT	ScHe	MgTr	HgMs	Pr	Adv	+	+
V. pisiformis L.	HKr	MgT	He	MsTr	Ms	Sil	–	+	–
V. sepium L.	HKr	MsT	He	MgTr	Ms	SMnPr	–	+	+
V. tenuifolia Roth.	HKr	MsT	He	MgTr	MsX	SMnStPr	–	+	+
V. tetrasperma (L.) Schreb.	T	MsT	ScHe	MgTr	XMs	RuSMnPr	Adv	+	+
V. villosa Roth.	HKr	MgT	ScHe	MgTr	XMs	RuSMnPr	–	+	+
Fagaceae									
Quercus robur L.	Ph	MsT	ScHe	OgMsMgTr	Ms	Sil	–	+	–
Fumariaceae									
Corydalis cava (L.) Schweigg. et Korte	G	MsT	ScHe	MgTr	Ms	Sil	RLD	+	–
Corydalis marschalliana Pers.	G	MgT	ScHe	MgTr	Ms	Sil	RLD	+	–
Corydalis solida (L.) Clairv.	G	MsT	ScHe	MgTr	Ms	Sil	–	+	–
Fumaria officinalis L.	T	MgT	He	MsTr	MsX	Ru	Adv	+	+
Fumaria schleicheri Soy.-Willem.	T	MgT	ScHe	MsTr	MsX	Ru	Adv	+	+
Gentianaceae									
Centaurium erythraea Rafn.	THKr	MgT	ScHe	OgMsTr	XMs	StPr	–	+	+
Centaurium pulchellum (Sw.) Druce	T	MsT	He	MsTr	HgMs	Pr	–	+	+
Gentiana pneumonante L.	HKr	MsT	ScHe	MsTr	MsHg	SilPalPr	RLD	+	–
Geraniaceae									
Erodium cicutarium (L.) L Her.	T	MgT	ScHe	OgMsTr	XMs	SilPtStRu	–	+	–
Geranium collinum Steph.	HKr	MgT	ScHe	AlkTr	HgMs	PalHalPr	–	+	+
G. divaricatum Ehrh.	T	MgT	ScHe	OgMsTr	XMs	RuSil	–	+	–
G. palustre L.	HKr	MgT	ScHe	MsTr	MsHg	PrPal	RLD	+	–
G. pratense L.	HKr	MsT	HeSc	MsTr	Ms	PrSMn	RLD	+	+
G. pusillum L.	T	MgT	He	MsTr	MsX	Ru	Adv	+	+
G. robertianum L.	T	MgT	ScHe	OgMsTr	XMs	PtPsSil	–	+	–
G. sanguineum L.	G	MgT	ScHe	OgTr	XMs	PsSil	–	+	–
Grossulariaceae									
Ribes aureum Pursh	nPh	MsT	ScHe	MsTr	Ms	SilSMnCu	Adv	+	–
Haloragaceae									
Myriophyllum spicatum L.	HKr	MsT	ScHe	MsTr	Hy	Aq	–	+	+
M. verticillatum L.	HKr	MgT	HeSc	MsTr	Hy	Aq	–	+	–
Lamiaceae									
Acinos arvensis (Lam.) Dandy	T,HKr	MsT	ScHe	MsTr	MsX	RuPtSt	–	+	–
Ajuga genevensis L.	G	MgT	ScHe	MsTr	XMs	RuPrSil	–	+	+
Ballota nigra L.	HKr	MsT	ScHe	MsTr	Ms	SilRu	Adv	+	+
Betonica officinalis L.	HKr	MgT	ScHe	OgTr	Ms	PrSil	RLD	+	+
Chaiturus marrubiastrum (L.) Reichenb.	T HKr	MgT	ScHe	MsTr	XMs	RuPrSMn	–	+	–
Clinopodium vulgare L.	HKr	MgT	ScHe	MsTr	XMs	SilSMn	–	+	–

1	2	3	4	5	6	7	8	9	10
Galeopsis. speciosa Mill.	T	MgT	ScHe	MsTr	XMs	RuSMn	–	–	+
G. tetrahit L.	T	MgT	ScHe	Og-MsTr	Ms	RuPsSil	–	+	–
Glechoma hederacea L.	HKr	MsT	HeSc	MsTr	Ms	RuPrSil	–	+	+
G. hirsuta Waldst. et Kit.	HKr	MsT	HeSc	MsTr	Ms	Sil	–	+	–
Lamium amplexicaule L.	T HKr	MsT	He	OgMsTr	XMs	Ru	Adv	+	+
L. purpureum L.	T HKr	MgT	ScHe	MsTr	XMs	Ru	Adv	+	+
Leonurus cardiaca L.	HKr	MsT	ScHe	MgTr	XMs	SMnRu	Adv	+	–
L. villosus Desf. ex D'Urv.	HKr	MgT	ScHe	MsTr	MsX	Ru	–	+	+
Lycopus europaeus L.	HKr	MgT	ScHe	MgTr	MsHg	PrPal	–	+	+
L. exaltatus L.fil.	HKr	MsT	ScHe	MgTr	MsHg	PrPal	–	+	+
Marrubium praecox Janca	HKr	MgT	He	MsTr	MsX	RuStPt	–	–	+
Mentha arvensis L.	HKr	MgT	ScHe	MsTr	HgMs	RuPrSil	–	+	–
M. aquatica L.	HKr	MgT	ScHe	MsTr	Hg	PalAq	–	+	+
Nepeta cataria L.	HKr	MsT	ScHe	MsTr	XMs	RuStSil	Adv	+	+
N. pannonica L.	HKr	MgT	ScHe	MsTr	MsX	SMnSt	–	+	+
Origanum vulgare L.	HKr	MgT	ScHe	MgTr	MsX	StSMnPr	–	+	–
Phlomis tuberosa L.	HKr	MgT	He	MsTr	MsX	PrSMnSt	–	–	+
Prunella vulgaris L.	HKr	MsT	He	MgTr	Ms	RuPrSil	–	+	–
Salvia verticillata L.	HKr	MsT	ScHe	MsTr	MsX-Ms	PrStRu	–	–	+
Scutellaria altissima L.	HKr	MgT	HeSc	MgTr	Ms	Sil	RLD	+	–
S. galericulata L.	G	MgT	ScHe	MgTr	Hg	PrPal	–	+	–
S. hastifolia L.	HKr	MsT	ScHe	MgTr	HgMs	PalPr	–	+	–
Stachys palustris L.	G	MT	ScHe	MgTr	Hg	PrPal	–	+	+
S. recta L.	HKr	MgT	He	OgTr	MsX	SMnSt	–	+	+
S. sylvatica L.	HKr	MgT	HeSc	MgTr	Ms	Sil	–	+	–
Teucrium chamedris L.	Ch	MgT	ScHe	OgMsTr	MsX	SMnPtSt	–	+	+
T. scordium L.	HKr	MsT	ScHe	MgTr	HgMs	PalPr	–	+	+
Lentibulariaceae									
Utricularia vulgaris L.	HKr	MgT	ScHe	MgTr	Hy	Aq	RLD	+	–
Limoniaceae									
Limonium tomentellum (Boiss.) O.Kuntze	HKr	MgT	He	AlkTr	XMs	StHalPr	–	–	+
Loranthaceae									
Viscum album L.	nPh	MgT	ScHe	Par	HgMs	Sil	–	+	+
Lythraceae									
Lythrum salicaria L.	HKr	MsT	He	MgTr	MsHg	PrAqPal	–	+	+
L. virgatum L.	HKr	MsT	He	MgTr	MsHg	AqPalPr	–	+	+
Peplis portula L.	HKr	MgT	ScHe	MsTr	MsHg	PsPalPr	–	+	+
Malvaceae									
Althaea officinalis L.	HKr	MgT	He	AlkMgTr	Ms	HalPalPr	Adv	+	+
Lavatera thuringiaca L.	HKr	MgT	ScHe	MgTr	MsX	RuStPr	–	–	+
Malva pusilla Smith	T	MsT	ScHe	MsTr	XMs	Ru	Adv	+	+
Moraceae									
Morus alba L.	Ph	MgT	He	MsTr	Ms	CuSilRu	Adv	+	+
Nymphaeaceae									
Nuphar lutea (L.) Smith	HKr	MgT	He	MsTr	Pl	Aq	RLD	+	+
Nymphaea alba L.	HKr	MgT	ScHe	MsTr	Pl	Aq	RLD	+	–
Oleaceae									
Fraxinus excelsior L.	Ph	MgT	ScHe	MsMgTr	Ms	Sil	–	+	+
F. lanceolata Borkh.	Ph	MsT	ScHe	MsTr	Ms	CuRuSil	Adv	+	+
Ligustrum vulgare L.	Ph	MgT	ScHe	MsTr	XMs	PtSil	–	+	–
Onagraceae									
Epilobium hirsutum L.	HKr	MsT	He	MgTr	MsHg	PrPal	–	+	+
E. palustre L.	HKr	MsT	He	MgTr	MsHg	PrPal	RLD	+	–
E. parviflorum Schreb.	HKr	MgT	He	MsTr	Hg	PrPal	–	+	–
E. roseum Schreb.	HKr	MgT	ScHe	MgTr	HgMs	PalPr	–	+	–
Papaveraceae									
Chelidonium majus L.	HKr	MsT	HeSc	MsMgTr	Ms	RuSil	–	+	+
Plantaginaceae									
Plantago cornuti Gousn.	HKr	MT	He	AlkTr	Ms	HalPr	–	–	+
P. lanceolata L.	HKr	MT	He	MsTr	XMs	PrStSMnRu	–	+	+
P. major L.	HKr	MgT	He	MgTr	Ms	RuPr	–	+	+
P. media L.	HKr	MgT	He	MgTr	MsX	RuSilPrSt	–	+	+
Polygalaceae									
Polygala comosa Schruhr	HKr	MsT	ScHe	MsTr	Ms	PrSMn	–	+	+
Polygonaceae									
Fallopia convolvulus (L.) A.Love	T	MT	ScHe	MsTr	XMs	Ru	Adv	+	+
Persicaria amphybia (L.) Delarbre	HKr	MsT	ScHe	MsTr	PlHg	AqPal	–	+	+
P. dubia (Stein) Fourr.	T	MsT	ScHe	MgTr	XMs	PrHal	RLD, ERL	–	+
P. hydropiper L.	T	MsT	ScHe	MsTr	HgMs	RuSilPalPr	–	+	–
P. lapathifolia (L.) Delarbe	T	MsT	He	OgTr	HgMs	PalPsPr	–	+	+
P. maculosa S.F.Gray	T	MgT	He	MsTr	Ms	RuPr	–	–	+
P. minor (Huds.) Opiz	T	MgT	ScHe	OgMsTr	MsHg	SilPalPr	–	+	+
Polygonum scabra (Moench) Moldenke	T	EuT	He	MgTr	XMs	RuPr	–	+	+
P. aviculare L.	T	EuT	ScHe	MsTr	MsX	Ru	–	+	+
Rumex acetosa L.	G	MgT	He	MgTr	XMs	SMnPr	–	+	–
R. acetosella L.	HKr	MsT	ScHe	OgMsTr	Ms	RuPrSMnPs	–	+	+
R. aquaticus L.	HKr	MgT	ScHe	MgTr	MsHg	PalSMn	–	+	–

1	2	3	4	5	6	7	8	9	10
R. confertus Willd.	HKr	MsT	ScHe	MsTr	XMs	RuPrSMn	–	+	+
R. crispus L.	HKr	MT	He	MsTr	Ms	RuPr	–	+	+
R. hydrolapatum Huds.	HKr	MgT	He	MsTr	Hg	AqPal	–	+	–
R. longifolius DC.	HKr	MgT	He	MsTr	Ms	RuSMnPr	Adv	+	+
R. maritimus L.	HKr	MsT	He	AlkTr	HgMs	HalPr	–	–	+
Primulaceae									
Glaux maritima L.	HKr	MsT	ScHe	AlkTr	HgMs	PrHal	–	–	+
Hottonia palustris L.	HKr	MsT	ScHe	MsTr	Hy	AqPal	RLD	+	–
Lysimachia nummularia L.	HKr	MgT	ScHe	MgTr	HgMs	SilPr	–	+	–
L. vulgaris L.	HKr	MgT	ScHe	MgTr	MsHg	Pal	–	+	+
Ranunculaceae									
Aconitum nemorosum Bieb. ex Reichenb.	HKr	MsT	HeSc	MgTr	Ms	SMn	RLD	+	–
A. rogoviczii Wissjul.	HKr	MsT	ScHe	MsTr	XMs	Sil	RLD	+	–
Anemone ranunculoides (L.) Holub	G	MgT	HeSc	MgTr	Ms	Sil	RLD	+	–
Batrachium circinatum (Sibth.) Spach	HKr	MgT	HeSc	AlkTr	Hy	Aq	–	+	–
B. trichophyllum (Chaix) Bosch	HKr	MsT	ScHe	MsTr	Hy	Aq	–	+	+
Caltha palustris L.	HKr	EuT	He	MsTr	Hg	PrPal	RLD	+	–
Ceratocephala testiculata (Crantz) Besser	T	MgT	He	MsTr	MsX	RuSt	–	+	+
Consolida regalis S.F.Gray	T	MsT	ScHe	MsTr	MsX	SMnRu	Adv	+	+
Ficaria verna Huds.	G	MsT	HeSc	MgTr	Ms	Sil	–	+	–
Ranunculus auricomus L.	HKr	MgT	ScHe	MgTr	Ms	SilPr	RLD	+	+
R. flammula L.	HKr	MsT	He	MsTr	HgMs	PalPr	RLD	+	+
R. lingua L.	HKr	MgT	ScHe	MsTr	MsHg	PrPal	RLD	+	–
R. pedatus Waldst. et Kit.	G	MgT	ScHe	MgTr	XMs	StPr	–	+	+
R. polyanthemos L.	HKr	MsT	ScHe	MsMgTr	XMs	StSMnPr	–	+	–
R. polyphyllus W.K.	HKr	MgT	ScHe	MsTr	Hy	PalAq	RLD	+	–
R. repens L.	HKr	MgT	ScHe	MgTr	HgMs	PalPr	–	+	+
R. sceleratus L.	T	MsT	ScHe	MsMgTr	HgMs	PrPal	–	+	+
Thalictrum flavum L.	HKr	MgT	ScHe	MsMgTr	Hg	PalPr	–	+	+
Th. lucidum L.	HKr	MsT	ScHe	MgTr	Hg	Pr	RLD	+	+
Th. simplex L.	HKr	MsT	ScHe	MsMgTr	Ms	SMnPr	–	+	+
Resedaceae									
Reseda lutea L.	T	MgT	He	MsTr	Ms	RuPtSt	Adv	+	+
Rhamnacaceae									
Frangula alnus Mill.	nPh	MgT	HeSc	Og-MgTr	HgMs	SMnSil	–	+	–
Rhamnus catartica L.	nPh	MsT	ScHe	MgMsTr	XMs	SilSMn	–	+	–
Rosaceae									
Agrimonia eupatoria L.	HKr	MgT	ScHe	MgMsTr	XMs	SMnSt	–	+	+
Armeniaca vulgaris Lam.	Ph	MgT	He	OgMsTr	MsX	RuSilCu	Adv	+	+
Crataegus fallacina Klokov	nPh	MsT	ScHe	MsMsTr	MsX	SilSMnPtSt	–	+	–
C. leimonogina Klokov	Ph	MsT	ScHe	MsTr	MsX	SilStSMn	–	+	+
Filipendula ulmaria (L.) Maxim.	G	MgT	HeSc	MgTr	MsHg	SMnPalPr	–	+	–
Fragaria campestris Steven	HKr	MsT	ScHe	MsTr	XMs	SMnSt	–	+	+
F. vesca L.	HKr	MgT	HeSc	MgTr	Ms	Sil	RLD	+	–
F. viridis Duch.	HKr	MgT	ScHe	MsTr	XMs	StSMn	–	+	+
Geum urbanum L.	HKr	MsT	ScHe	OgMsTr	Ms	RuSil	–	+	–
Malus praecox (Pall.) Borkh.	Ph	MsT	HeSc	MgMsTr	XMs	SilStSMn	–	+	+
M. sylvestris Mill.	Ph	MgT	HeSc	MsTr	XMs	SMnSil	–	+	–
Potentilla anserina L.	HKr	EuT	He	AlkMgTr	MsHg	Pr	–	+	+
P. argentea L.	HKr	MsT	He	MsTr	MsX	SilPrStRu	–	+	+
P. heptaphylla L.	HKr	MsT	He	MsTr	MsX	PrSil	RLD	+	+
P. neglecta Baumg.	HKr	MgT	He	MsTr	MsX	RuSt	–	+	+
P. obscura Willd.	HKr	MsT	He	MgTr	XMs	SilPt	–	+	+
P. reptans L.	HKr	MgT	He	MsTr	HgMs	SMnPr	–	+	+
P. supina L.	THKr	MT	He	MsMgTr	Ms	PrRu	–	–	+
Prunus stepposa Kotov	Ph	MsT	ScHe	MsTr	MsX	SMnSt	–	+	+
Pyrus communis L.	Ph	MgT	ScHe	MgMsTr	MsX	StSMnSil	–	+	+
Rosa canina L.	nPh	MgT	ScHe	MsTr	XMs	RuSMnSt	–	+	+
R. corymbifera Borkh.	nPh	MgT	ScHe	MsTr	MsX	RuSMnSt	–	+	+
Rubus caesius L.	nPh	MgT	ScHe	MsT	Ms	RuSil	–	+	+
Sanguisorba officinalis L.	HKr	MsT	ScHe	MgTr	Ms	SMnPr	RLD	+	+
Rubiaceae									
Galium aparine L.	T	MgT	ScHe	MgTr	XMs	SilRu	–	+	–
G. boreale L.	HKr	MgT	ScHe	MgTr	Ms	PrSMn	–	+	–
G. elongatum C.Presl.	HKr	MgT	HeSc	MgTr	Hg	SilPal	–	+	–
G. mollugo L.	HKr	MsT	ScHe	MsTr	XMs	SilPr	–	+	–
G. palustre L.	HKr	MsT	ScHe	MgTr	MsHg	PalPr	–	+	–
G. physocarpum Ledeb.	HKr	MgT	HeSc	MgTr	Ms	SilPr	–	+	+
G. rivale (Sibth.et Smim) Griseb.	HKr	MgT	HeSc	MsTr	HgMs	SMnPr	–	+	–
G. rubioides L.	HKr	MgT	He	MsTr	Ms	Pr	–	+	+
G. trifidum L.	HKr	MsT	ScHe	MgTr	MsHg	PrPal	RLD	+	+
G. tyraicum Klokov	HKr	MsT	HeSc	CaOgTr	X	PtSilPs	RLD	+	–
G. uliginosum L.	HKr	MsT	HeSc	MsTr	MsHg	PrSilPal	RLD	+	–
G. vaillantii DC.	T	MsT	He	MsTr	MsX	StRu	Adv	+	–
Rubia tatarica (Trev.) Fr. Schmidt	HKr	MsT	HeSc	MsTr	MsX	PsPr	RLD	+	+
Salicaceae									
Populus alba L.	Ph	MgT	He	OgMsTr	HgMs	Sil	–	+	+

1	2	3	4	5	6	7	8	9	10
P. nigra L.	Ph	MgT	He	OgMsTr	HgMs	Sil	–	+	+
P. tremula L.	Ph	MsT	ScHe	OgMsTr	HgMs	Sil	–	+	–
Salix alba L.	Ph	MsT	ScHe	Og-MgTr	HgMs	Sil	–	+	+
S. aurita L.	Ph	MsT	ScHe	Og-MgTr	MsHg	PsSMnPal	RLD	+	–
S. caprea L.	Ph	MgT	ScHe	OgMsTr	Ms	SilSMn	RLD	+	–
S. cinerea L.	Ph	MgT	ScHe	MgMsTr	MsHg	SilPal	–	+	+
S. fragilis L.	Ph	MgT	He	MsTr	XMs-MsHg	SilPr	Adv	+	+
S. pentandra L.	Ph	MgT	HeSc	MsTr	MsHg	PalSil	–	+	–
S. rosmarinifolia L.	nPh	MgT	ScHe	MsTr	MsX-MsHg	SilPs	–	+	–
S. triandra L.	Ph	MsT	He	MgTr	HgMs	SilPr	–	+	+
S. vinogradovii A. Skvorts.	Ph	MgT	He	OgMsTr	HgMs	SilPr	–	+	+
Scrophulariaceae									
Euphrasia brevipila Burn. et Gremlin	T	MsT	He	MsTr	XMs	Pr	–	–	+
E. stricta D.Wolff ex J.F.Lehm.	T	MgT	HeSc	OgMsTr	Ms	SMnSil	–	+	–
Gratiola officinalis L.	HKr	MsT	ScHe	MsTr	Ms	PsPr	–	+	+
Linaria genistifolia (L.) Mill	HKr	MgT	He	OgMsTr	X	PtStPs	–	+	–
L. vulgaris Mill.	G	MsT	ScHe	MsTr	MsX	SMnPrRu	–	+	+
Melampyrum nemorosum L.	T	MgT	ScHe	OgMsTr	Ms	PsPrSil	RLD	+	–
M. pratense L.	T	MsT	ScHe	MsTr	Ms	PrSMnSil	RLD	+	–
Odontines vulgaris Moench	T	MgT	ScHe	MsTr	MsX	RuStPr	–	–	+
Pedicularis dasystachys Schrenk	HKr	MgT	He	AlkMsTr	Ms	HalPr	RLD	–	+
Rhinanthus vernalis (N.Zing.) Schischk.et Serg.	T	MgT	He	MsTr	Ms	RuSMnPr	–	+	–
Scrophularia nodosa L.	HKr	MsT	HeSc	MsMgTr	Ms	PrSMnSil	–	+	–
Verbascum densiflorum Bertol.	HKr	MgT	He	MsMgTr	XMs	RuPsSMn	–	+	+
V. lychnitis L.	HKr	MgT	ScHe	OgMsTr	MsX	RuSMn	–	+	–
V. nigrum L.	HKr	MgT	ScHe	MsTr	MsX	RuSMn	RLD	+	–
Veronica anagallis-aquatica L.	HKr	MgT	He	MsTr	HelHg	AqPal	–	+	+
V. arvensis L.	THKr	MgT	He	MsTr	MsX	StRu	Adv	–	+
V. austriaca L.	HKr	MgT	ScHe	CaMsTr	MsX	SilSMnSt	–	+	–
V. chamaedrys L.	HKr	MgT	ScHe	MsTr	Ms	PrSMn	–	+	–
V. hederifolia L.	T	MgT	ScHe	MsTr	XMs	RuSMnSt	–	+	–
V. longifolia L.	HKr	MgT	ScHe	MgTr	HgMs	SilPr	–	+	+
V. prostrata L.	HKr	MgT	ScHe	AlkMsTr	MsX	StPrSMn	–	–	+
V. scutellata L.	HKr	MsT	He	MsTr	MsHg	PalPr	RLD	+	+
V. serpyllifolia L.	HKr	MgT	He	MsTr	HgMs	RuSMnPr	RLD	+	+
V. spicata L.	HKr	MgT	ScHe	MsTr	MsX	SMnSt	–	–	+
V. spuria L.	HKr	MgT	ScHe	MsTr	XMs	StSMn	–	+	–
V. teucrium L.	HKr	MgT	ScHe	OgMsTr	XMs	StSMn	–	+	+
Solanaceae									
Hyoscyamus niger L.	HKr	MT	He	MsTr	MsX	Ru	Adv	–	+
Solanum dulcamara L.	Ch	MsT	ScHe	OgMsTr	MsHg	SilPal	–	+	+
S. nigrum L.	T	MgT	He	MsTr	Ms	Ru	Adv	+	+
Tiliaceae									
Tilia cordata Mill.	Ph	MsT	ScHe	MsMgTr	Ms	Sil	–	+	–
Ulmaceae									
Ulmus glabra Huds.	Ph	MgT	HeSc	MgTr	Ms	Sil	–	+	–
U. laevis Pall.	Ph	MsT	HeSc	Og-MgTr	Ms	Sil	–	+	–
U. minor Mill.	Ph	MgT	ScHe	MsTr	MsX	SilSMn	–	+	+
U. pumila L.	Ph	MgT	ScHe	OgMsTr	MsX	SilCuRu	Adv	+	+
U. suberosa Moench	Ph	MgT	ScHe	MsTr	X	SMn	–	+	+
Urticaceae									
Urtica diocica L.	G	MgT	He-Sc	MsMgTr	Ms	SilRu	–	+	+
U. galeopsifolia Wierzb. ex Opiz	HKr	MsT	HeSc	MgTr	MsHg	PalSil	–	+	–
Valerianaceae									
Valeriana officinalis L.	HKr	MsT	ScHe	MgTr	HgMs	SMnPr	RLD	+	–
V. rossica P. Smirn.	HKr	MsT	ScHe	MgTr	MsX	PrSt	RLD	+	+
V. stolonifera Czern.	HKr	MsT	ScHe	MsMgTr	Ms	PrSMnSil	RLD	+	–
Verbenaceae									
Verbena officinalis L.	HKr	MgT	ScHe	MsTr	Ms	SMnPrRu	Adv	+	+
Violaceae									
Viola canina L.	HKr	MgT	ScHe	MsTr	Ms	PrSil	–	+	–
V. collina Besser	HKr	MsT	ScHe	MsTr	MsX	SMnSt	–	+	+
V. hirta L.	HKr	MsT	ScHe	MsMgTr	XMs	StSil	–	+	+
V. matutina Klokov	THKr	MsT	ScHe	MsTr	XMs	RuSMnPr	–	+	–
V. mirabilis L.	HKr	MsT	HeSc	MsMgTr	Ms	Sil	–	+	–
V. odorata L.	HKr	MgT	HeSc	MsMgTr	Ms	RuSil	–	+	+
V. suavis M.Bieb.	HKr	MgT	HeSc	MsTr	HgMs	PrSil	–	+	–
V. tricolor L.	THKr	MsT	ScHe	MsTr	MsX	RuSMnPr	–	+	–

Notes: Climamorphs: Ph – phanerophytes, HKr – hemicryptophytes, G – geophytes, T – therophytes, Ch – hamephytes, Hel – helophytes, Hd – hydatophytes. Thermomorphs: MT – microtherms (types of northern climatic zones), MsT – mesotherms (types of temperate climatic zone), MgT – megatherms (species of subtropical or tropical climatic zones), EuT – eurytherms (species that can grow in almost all climatic zones). Heliomorphs: He (Heliophyton) – heliophytes (obligate sun-loving plants), Sc (Sciophyton) – sciophytes (obligate shade-loving plant species). Trophomorphs: OgTr (Oligotroph) – oligotrophs (species growing on nutrient-poor soils), MsTr (Mesotroph) – mesotrophs (species growing on soils medium in fertility), MgTr (Megatroph) – megatrophs (species tending to prefer soil high in fertility), Alk (Alkotroph) – alkotrophs (species growing on saline soils), Par – parasite. Hygromorphs: Hy (Hydatophyton) – hydatophytes (underwater plants, mostly totally immersed in water), Pl (Pleistophyton) – pleistophytes (species floating on the water's surface), Hel (Helophyton) – helophytes (species of shallow-water habitats), Hg (Hygrophyton) – hygrophytes (species of wet soils), Ms (Mesophyton) – mesophytes (inhabitants of fresh soils), X (Xerophyton) – xerophytes (species of dry habitats). Cenomorphs: Aq (Aqant) – aquant (aquatic species), Pal (Paludosus) – paludant (swampy species), Pr (Pratensis) – pratant (meadow species), Sil (Silvaticus) – sylvant (forest species), St (Stepposus) – stepant (steppe species), SMn (Margosilvaticus) – sylvomargoant (forest margin species), Ps (Psammophyton) – psammophyte (species of sandy soils), Pt (Petrophyton) – petrophyte (species of stony biotopes), Ru (Ruderatus) – ruderant (ruderal species), Hal (Halophyton) – halophyte (species of saline soils), Cu (Cultus) – culturant (cultural species). Adventive status – Adv. The rare flora fraction: RLD – Red List of Dnipropetrovsk Region; RBU – Red Book of Ukraine; ERL – European Red List.

Table 3
Comparative analysis bioecological phytodiversity of the Prysamar'ya forest ecosystems

Ecomorphs	Floodplain forests	Territory of treeless floodplain	Floodplain territory
The number of types of different climamorphs			
Therophytes	102	99	124
Geophytes	72	55	88
Hemicriptophytes	377	285	439
Hamephytes	7	7	10
Phanerophytes	57	29	56
Helophytes	7	6	7
Hydatophytes	4	4	4
The number of types of different thermomorphs			
Microtherms	12	12	16
Mesotherms	248	187	284
Megatherms	337	260	395
Eurytherms	31	27	32
The number of types of different heliomorphs			
Sciophytes	15	1	15
Heliosciophytes	112	29	115
Scioheliophytes	283	193	310
Heliophytes	216	262	288
The number of types of different trophomorphs			
Megatrophs	179	70	203
Mesotrophs	401	353	460
Oligotrophs	37	42	44
Alkotrophs	6	17	18
Parasites	3	3	3
The number of types of different hygromorphs			
Xerophytes	91	121	139
Mesophytes	355	241	418
Hygrophytes	127	87	129
Helophytes	14	14	14
Hydatophytes	28	15	28
Pleistophytes	10	7	10
The number of types of different cenomorphs			
Stepant	55	66	71
Sylvant	150	32	154
Sylvomargoant	35	20	35
Psammophyte	16	16	23
Petrophyte	3	4	7
Pratant	151	151	198
Paludant	73	47	64
Aquant	50	36	52
Ruderant	90	103	114
Halophyte	3	10	10
The rare flora fraction			
European Red List	1	2	2
Red Book of Ukraine, 2009	20	14	24
Red List of Dnipropetrovsk Region, 2010	134	60	148
Adventive*	89	97	105
Total species	628	486	728

Note: * – amendments of Protopopova (1991).

The bioecomorphic composition of flora is dominated by: hemicryptophytes (439), megatherms (395 species), scioheliophytes (310), mesophytes (418), mesotrophs (460), and cenomorphs dominated by forest (154) and meadow (198) species (Table 3).

Discussion

The analysis of floral richness shows that the floodplain forests of the Samara contain 628 species of vascular plants from 728 species of the entire floodplain territory and 887 species of the entire flora of the Samara River area. This confirms the position that the floodplains of the valley landscapes of the temperate zone of Europe (Schindler et al., 1916; Filipová & Pohanka, 2019) have the highest level of biodiversity.

A significant number of ruderal species (16.2%), of which 92.4% are adventive, evidence anthropogenic transformation of the Samara floodplain flora. Of the floodplain landscape flora, 628 species of vascular plants grow in forest communities, and 486 species grow in transformed, treeless floodplain territories (Table 3).

Of the total flora composition in the floodplain landscape of the Samara River area, within the spectrum of biomorphs and climamorphs there are almost twice as many wood and shrubby species as in treeless areas, and the remaining categories increased by approximately one third. Among helimorphs, there were several times more sciophytes in the forests, among the hygromorphs and there were a third more hygrophytes and mesophytes, and among trophomorphs there were twice as many megatrophs.

Ruderalization of the flora is more typical for the treeless floodplain areas (103 species) compared to the wooded floodplain (90 species).

Conclusion

Despite the long-term anthropogenic transformation, the valley-terrace landscape territory of the Samara River area, as one of the reference native complexes of the subarid territory of Eastern Europe, has preserved a significant level of phytodiversity. In this regard, it is planned to develop a National Park "Samara Bor" within this area.

The floodplain landscape is the richest in species and most diverse part of this complex. Its flora includes 728 plant species (including 132 rare ones), of which 631 grow in the forest communities, and 487 in anthropogenically transformed, treeless floodplain areas.

In the forest flora, the number of tree and shrubby species, scyophytes, hygrophytes, and megatrophs significantly increases, and the number of ruderal plant species decreases.

The floristic composition of the floodplain forests of the middle river of the subarid region is much richer and more diverse than the flora of the treeless floodplain areas, and this should encourage measures for their protection and restoration. Afforestation of floodplain territories within the steppe zone of Ukraine should be a priority in comparison with other landscapes.

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