BIODIVERSITY, SPATIAL AND CONSERVATION STATUS ASSESSMENT ON ALLUVIAL GALLERY-FORESTS WITHIN THE NATURA 2000 SITE CHEILE NEREI-BEUȘNIȚA

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Abstract. *Riparian broad-leaved forests are one of the most wide-spread type of plant community in temperate and boreal Europe; concurrently, they are classified as Natura 2000 habitat type 91E0 * Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae), which encompass more habitat sub-types (sensu EUR 28) and various plant associations (sensu PHYSYS-Palearctic, DEVILLERS et al., 2010). In spite of their floristic heterogeneity, these forests, even those patches without red-list indexed or annex-indexed species, play a great role within both semi-natural and agricultural landscapes (ecosystems services, aesthetic value, migration corridors etc.). We present the results of field studies conducted between April 2012 and October 2013 in the Cheile Nerei - Beușnița National Park (Caraș-Severin County, S-W Romania), which constitutes (with minor changes in their spatial limits) also a* Site of Community Importance *(ROSCI 0031) and a Special Protection Area for birds (ROSPA 0020); from a biogeographical point of view, Cheile Nerei-Beușnița belongs to Romanian continental region. Within the studied area, the habitat 91E0* occupies mainly the Nera valley, but also the valleys of smaller rivers (Bei, Beușnița, Șușara, Lăpușnic, Valea Mare etc.). From a floristic point of view, the habitat is defined by Alnus glutinosa, Fraxinus excelsior, and Salix sp.; the herbaceous layer is diverse (Angelica sylvestris, Aegopodium podagraria, Equisetum sp., Stellaria nemorum, Telekia speciosa etc.) and discontinuous. According to the Romanian habitats system (DONIȚĂ et al., 2005, 2006, GAFTA & MOUNTFORD, 2008), the vegetation we identified could be classified within types R4401, R4402, and R4405. As main threats we catalogued anthropic actions both on river bed (e.g. D01.01, D01.02, E03.01) and riparian vegetation (e.g. B06). A specificity of this habitat in Cheile Nerei-Beușnița is the significant ingression of species from proximate habitats (9180*, 91K0, 91Y0). The conservation status is unadequate, on most patches. The future management plan of the site should consider this habitat as one of the more impacted by the tourism development (rafting, cycling, pedestrian traffic etc.), giving the high potential of Nera Gorges and Sasca Montană area (ZOTA, 2012); SCHRÖTT, prior to 1972, recorded degradation signs (ruderalization) in Salicetum albae-fragilis, Salicetum triandrae, Salicetum purpureae, and Aegopodio-Alnetum coenosis from Nera and Bei valeys.*

INTRODUCTION

The riparian forests supply important ecosystem services: maintaining water quality and nutrient cycling (e.g. N - alders have root-nodules with symbiotic microorganisms that fix atmospheric nitrogen - PROCTOR, 2013), reducing the amount of sediments delivered to streams, providing habitat to aquatic life and organisms living in proximal ecosystems, and enhancing local biodiversity (various authors *in* AKAY *et al*., 2012). Shaped as gallery forests and scrubs or as extended floodplain forests, the ecosystems of this type constitute seldom the unique refuge for wildlife within agricultural landscapes in Europe, especially in plain and hilly

areas, where they are also under high anthropic pressure (directly and indirectly – YON, 1984 - recreational areas, hunting, wood resource etc.). These woody formations along channels, streams, rivers are important ecological corridors (FORMAN & GODRON, 1986, *in* BONIN, 2008). What makes the conservative importance of riverine semi-natural vegetation is not firstly the presence of plant species form red lists or 92/43/EEC Directive's annexes, but its functional roles; achieving a good ecological status of all European water bodies is also the main objective of the European Water Framework Directive (WFD; European Community [EC] 2000). Biotic communities of riparian forests are significantly correlated with hydromorphologic conditions (Van LOOY *et al*., 2008). DELLA ROCA *et al*. (2014) demonstrate the importance for saproxylic beetles (*Antibridae, Elateridae, Melasidae, Latritiidae, Cerambicidae* etc.) of maintaining the dead wood and the extensive management in the riparian forests (91E0*and 91F0) in Italy. From a floristic and coenological perspective, riparian European woody vegetation is diverse, as the climatic and soils are diverse, from Scandinavia to Greece, from low altitudes to mountain belts. Riverine forests in Romania (e.g. GAFTA & MOUNTFORD, 2008) are dominated, as general rule, by *Quercus robur*, *Fraxinus excelsior*, *F. angustifolia*, *Ulmus spp.*, *Salix spp.*, *Populus spp.* - in plane areas, *Alnus glutinosa*, *Fraxinus excelsior*, *Salix spp.* – in hilly and low-mountain areas, and *Alnus incana* (often co-dominant with *Alnus glutinosa*) – in high mountains. The presence of non-native species and hybrids from genus *Populus* diminishes the natural value of such gallery forests. Natura 2000 system considers two main habitats types of riparian woods (EUR 28): 91E0* - *Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)* and 91F0 - *Riparian mixed forests of Quercus robur, Ulmus laevis and Ulmus minor, Fraxinus excelsior or Fraxinus angustifolia, along the great rivers (Ulmenion minoris)*. *Ripisilvae* from South and Eastern Europe belongs to types 92A0 - *Salix alba* and *Populus alba* galleries, 92B0, 92C0, 92D0 and other minor (given the respectively occupied areas) types.

Our study is part of a larger project (see Acknowledgements) subjacent to a national and European effort to map and evaluate the conservation status of species and habitats in Natura 2000 Romanian sites. The Cheile Nerei-Beușnița has the status of national park since 2003 (Romanian Government Decision 230/2003); with minor changes in its limits, the park is also an Site of Community Importance (ROSCI0031 – declared as so by Ministry's Orders no. 1964/2007 and 2387/2011) a Special Protection Area (ROSPA0020 - declared as such by Romanian Government Decisions no. 1284/2007 and 971/2011).

The aim of this study is to offer an image of habitat 91E0* distribution inside the site ROSCI0031, its cormophytes diversity, list of current threats and the main conservation and monitoring directions of this priority habitat, based on field campaigns 2012 and 2013.

MATERIAL AND METHODS

Field data collect took place in 2012 and 2013. We recorded vegetation along major water streams inside the SCI (Nera, Bei, Șușara, Miniș, Valea Mare, Beușnița, Călugăra …), in 400 m^2 plots, according to braun-blanquetian soil covering scale (from "+" to "5"). Recordings of cormophytes flora were made outside the vegetation rélevés, also. Plant nomenclature follows *The Plant List*. As phytosociological referentials, we used COLDEA (1991) and SANDA *et al*. (2008). Habitats identification was made according to Romanian typology (DONIȚĂ *et al*., 2005, 2006) and Romania manual of habitat interpretation (GAFTA & MOUNTFORD, 2008). The list of threats and pressures was assessed *in situ*, by direct observations, and by discussions with the staff of national park administration. Some

conclusions were drawn from comparisons with vegetation studies made by SCHRÖTT (1972) in Cheile Nerei Natural Reserve and by COSTE (1974) and PEIA (1979) in contiguous areas: Munții Locvei, and respectively Almăj Depression. Our study did not target bryophytes.

RESULTS AND DISCUTIONS

The Site of Community Importance Cheile Nerei-Beușnița covers *grosso modo* the Anina Mountains area, part of the largest calcareous formation in Romania - 807 km^2, between Reșița and Moldova Nouă (BLEAHU, 1982). The highest altitude in Anina Mountains is reached in the Leordiș Peak – 1160 m (SENCU, 1978). The most important river in the area is Nera, 23 km long, with a gorges sector; its most important tributary from the Anina Mountains is Bei. Two small lakes increase the landscape diversity and are touristic attractions: Ochiul Bei and Dracului Lake (Devil's Lake). The multiannual average flow of Nera at Sasca Montană (outcome point from the SCI) was about 1,7 m^3/s (UJVARI, 1972).

Priority habitat 91E0* is widespread in Europe: from 28 EU countries, it is absent from Cyprus (initially, the *Alnus glutinosa* riverine forests from this country were assigned also to the type 91E0* - EVANS, 2006) and Greece. From the member states deliveries under Article 17 (Dec. 2013[1]), it appears that the habitat is present mainly in the atlantic (ATL) and continental (CON) European bioregions, but also in the alpine (ALP), boreal (BOR), mediteraneean (MED), pannonian (PAN) and Black Sea (BLS) bioregions. Alluvial forests (91E0*) habitat is also the most targeted by LIFE projects: 191 projects (including restoration projects), followed by the habitat 6430 (hydrophilous tall herb fringe communities), with 120 projects (SILVA *et al*., 2010).

The Palearctic – EUNIS coresspondance concerning the 91E0* habitat is as follows:

Palearctic codes and types corresponding to the habitat 91E0* (according to EUR 28)	EUNIS code and type (correspondance acording to MOSS & DAVIES, 2002)
44.13 - Middle European white willow forests	G1.1/P-44.13 Middle European [*Salix alba*] forests (G1.111)
44.2 - Boreo-alpine riparian galleries	G1.1/P-44.2 Boreo-alpine riparian galleries (G1.12)
44.3 - Middle European stream ash-alder woods	G1.2/P-44.3 Riverine [*Fraxinus*] - [*Alnus*] woodland, wet at high but not at low water

From a general ecological perspective, the habitat 91E0* is characterized by eutrophic – (sub)wet soils (tab. 1.) and by slightly acid-calcareous soil reaction (tab. 2).

Table 1.

Place of the habitat 91E0* in the matrix of Environmental Qualifiers – BUNCE *et al*. (2008)

1 http://bd.eionet.europa.eu/activities/Reporting/Article_17/Reports_2013/Member_State_Deliveries

	Ellenberg values	Aquatic	Water logged	Seasonally wet	Wet	Mesic	Dry	Very Dry	Xeric	Semidesert	Desert
Eutrophic	F > 7	1.1	2.1	**3.1**	**4.1**	5.1	6.1	7.1	8.1	9.1	10.1
Acid		1.2									10.2
Neutral		1.3									10.3
Basic		1.4									10.4
Saline low		1.5									10.5
Saline medium		1.6									10.6
Saline high		1.7	2.7	3.7	4.7	5.7	6.7	7.7	8.7	9.7	10.7

Tabel 2.

Soil humidity, soil reaction and characteristic species for the habitat 91E0* (WALENTOWSKI *et al.* (2013, based on EWALD, 2007)

Soil humidity scale	Soil reaction				
	extremly acid	strongly acid	moderately acid	slightly acid	calcareous
xeric					
mesic					
subhygric					
hygric				*Carex remota* *Equisetum arvense* *Equisetum hyemale* *Matteucia struthiopteris* *Petasites hybridus* *Silene dioica* *Telekia speciosa*	*Carex pendula* *Chrysosplenium alternifolium* *Equisetum telmateia*
subhygric					
hydric					

The coenological situation of alders formations is complicated and the phytosociological interpretation is different in European countries: Hungary, Austria (SZMORAD, 2011) Czech Republic (DOUDA, 2008), Slovakia (HRIVNÁK *et al*., 2013). The Romanian interpretation manual of Natura 2000 habitats (GAFTA & MOUNTFORD, 2008) gives as correspondent associations to 91E0* type: *Telekio speciosae-Alnetum incanae* Coldea (1986) 1991; *Stellario nemorum-Alnetum glutinosae* (Kästner 1938) Lohmeyer 1957; *Carici brizoidis-Alnetum glutinosae* Horvat 1938 em. Oberd. 1953; *Carici remotae-Fraxinetum* Koch ex Faber 1936; *Pruno padi-Fraxinetum* Oberdorfer 1953; *Salicetum fragilis* Passarge 1957; *Salicetum albae* Issler 1924. Unfortunately, there is no an up to date phytosociological Romanian referential to be used in habitats identification and interpretation.

SCHRÖTT (1972) identify in Cheile Nerei-Beușnița 4 associations underlying now the 91E0* habitat (tab. 3). COSTE (1984) includes the relevés made by SCHRÖTT (1972, under the name *Aegopodio-Alnetum*, from Nera and Bei valeys), as wel as those made by PEIA (1979, from Almăj Valey, under the same association – *Aegopodio-Alnetum*) in the association

Stellario nemori-Alnetum glutinosae (Kästner 1938) Lohm. 1957. The tree-willows communities identified by SCHRÖTT (1972) are grouped in three associations (tab. 3.)

Tabel 3.

Corespondance between phytosociological scheme of four 91E0*-sujacent associations found by SCHRÖTT (1972) in Cheile Nerei and a main phytosociological Romania synthesis.

	SCHRÖTT (1972) (Cheile Nerei monograph study)	SANDA *et al.* (2008) (national synthesis)
Willows galeries		
	Salicetum purpureae Soó 1934	*Saponario-Salicetum purpureae* (Br.-Bl. 1930) Tschou 1946
Association	*Salicetum triandrae* Malcuit 1929	
Alliance	*Salicion triandrae* Müller et Görs 1958	*Salicion triandrae* Th. Müller et Görs 1958
	Salicetum albae-fragilis Issler 1926	
Alliance	*Salicion albae* (Tx. 1955). Müller et Görs 1958	
Order	*Salicetalia purpureae* Moor 1958	
Class	*Salicetea purpureae* Moor. 1958	
Black alder-riparian galleries:		
Association	*Aegopodio-Alnetum* Kárpáti et Iurko 1961	*Aegopodio-Alnetum* Kárpáti et Jurko 1961
Alliance	*Alno-Padion* Knapp 1942	*Alno-Ulmion* Br.-Bl. et R. Tüxen 1943 em. Th. Müller et Görs 1958
Order	*Fagetalia* (Pawl. 1926) Tx. et Diem. 1936	*Fagetalia sylvaticae* Pawlowski in Pawlowski *et al.* 1928
Class	*Querco-Fagetea* Br.-Bl. et Vlieg. 1937	*Querco-Fagetea* Br.-Bl. et Vlieger in Vlieger 1937 em. Borhidi 1996

A simplified key to identify main riverine tree habitats in Romania is given in the table 4.

Table 4.

Simplified key to woody riparian habitats determination in Romania (after DONIȚĂ *et al*., 2005, GAFTA & MOUNTFORD, 2008, DEVILLERS *et al*., 2010, BUNCE *et al*., 2012).

	Dominant species (physiognomic trait)	*Plant association*	*Romanian habitat type*	*EUR 28*	*Observations*
	Alnus incana + *Betula pendula* (+ *Alnus glutinosa*)	*Telekio speciosae - Alnetum incanae* Coldea (1986) 1991	R4401	91E0* (Palearctic 44.2)	beech and spruce belts
	Alnus glutinosa + *Fraxinus excelsior* (+	*Stellario nemorum-*	R4402	91E0*	hilly and low mountains areas,

along **smaller** rivers	Alnus incana)	*Alnetum glutinosae* (Kästner 1938) Lohmeyer 1957		(Palearctic 44.3)	seasonally wet, eutrophic soils
	"arborescent, non-mediteraneean" *Salix* (*Salix alba*, + *S. fragilis* + Populus nigra + *P. alba*)	*Salicetum albae* Issler 1924	R4405	91E0* (Palearctic 44.13)	plains and hills, seasonally wet eutrophic soils
		Salicetum albae-fragilis Issler 1926 em. Soó 1957	R4407, R4408		mostly plains, seasonally wet, eutrophic soils
along **major** rivers	*Quercus robur* + *Ulmus laevis* + *U. minor* + *Fraxinus excelsior* + *F. angustifolia*	*Quercetum roboris-pedunculiflorae* Simon 1960, *Fraxinetum pallisae* (Simon 1960) Krausch 1965, …	R4404, R4409, R4410, R4411	91F0 (Palearctic 44.4.)	low altitudes, wet/neutral
	Populus alba + (>) *Salix alba* + *Fraxinus angustifolia* + other poplars	Salici-Populetum Meijer-Drees 1936	R4406	92A0 (Palearctic 44.141, 44.162, 44.6)	low altitudes, seasonally wet/eutrophic

OPREA *et al*. (2010) draw out a list of the most important cormophyte species (relict, endemic, endangered, critical endangered and vulnerable) found in riverine woody alders and willows riparian forests in Romania: *Angelica palustris* (Besser) Hoffm., *Carex strigosa* Huds., *Dryopteris cristata* (L.) A.Gray, *Euonymus nanus* M.Bieb., *Euphorbia carpatica* Wol., *Ligularia sibirica* (L.) Cass., *Lysimachia nemorum* L., *L. thyrsiflora* L., *Poa remota* Forselles, *Polemonium caeruleum* L., *Ribes nigrum* L., *R. spicatum* Robson, *Salix aurita* L., *S. daphnoides* Vill., *Tephrosis crispa* (Jacq.) Rchb. (= *Senecio rivularis* (Waldst. & Kit.) DC., *Syringa josikaea* J.Jacq. ex Rchb.f., *Tulipa sylvestris* L. subsp. *australis* (Link) Pamp. None of these species is found by SCHRÖTT (1972) or by our research (Annex 1).

The list of cormophyte species we found in Cheile Nerei-Beușnița is presented in the Annex 1. Alongside 91E0* characteristic species and surrounding forest species, we found species which presence could be interpreted as a ruderalization symptom of the habitat (e.g. *Carduus nutans* L., *Chenopodium album* L., *Cirsium arvense* (L.) Scop., *Descurainia sophia* (L.) Webb ex Prantl, *Papaver dubium* L., *Xanthium spinosum* L.), and species-symptoms of anthropization (e.g. *Morus alba* L., *Prunus cerasifera* Ehrh.. YON (1984) consider the occurence of *Clematis vitalba* L. and *Vitis sylvestris* C.C. Gmel. a symptom of healthy ecosystems, that should not be supressed by sylvocultural measures.

The main pressures we identified are linked to tourism and recreational activities and affects the 91E0* patches on the Nera and Bei rivers. Giving the topography and the general dominance of the forest, the grazing has a minor impact (BERGMEIER *et al*., 2010, recommends the exclusion of grazing from the management measures of this habitat). Invasive species (e.g. non-european native ashes) are not a pressure, but a threats, seeing the small *Ailanthus altissima* (Mill.) Swingle and *Acer negundo* L. populations found whithin the borders of the site. Naturally, the tourism will increase (ZOTTA, 2012), and the related impacts should be taken into account as threats, also.

Monitoring scheme proposal

The habitat monitoring and surveillance (defined by BUNCE *et al*., 2008) schemes applied in Europe are diverse (LENGYEL *et al*., 2008). National detailed monitoring protocols for plant species and habitats are not yet available. In the case of linear patches of 91E0* habitat we found inside the ROSCI0031, we consider appropriate a fine monitoring scheme (SALLES & SCHLEICHER, 2011), characterized by the use of 1:2,500 scale maps and a frequency of 3 year. As a supplementary measure, given the syndinamic relations with other riparian habitats, we propose to consider 300 m or 500 m rivers sectors as monitoring units. In each sector, the set of parameters to be monitorized, we propose to be composed by 4 categories of indicators:

a) the presence and the abundance of characteristic species: *Alnus glutinosa, Fraxinus excelsior, Salix alba, S. purpurea, S. purpurea, S. x fragilis, Filipendula ulmaria, Angelica sylvestris, Cardamine spp., Rumex sanguineus, Carex spp., Cirsium oleraceum*;
b) presence of other species indicating successional tendencies;
c) presence of non-native species as: *Impatiens glandulifera* Royle, *Solidago spp.* (e.g. *S. gigantea* Aiton), *Reynoutria japonica* Houtt. (found by us in Ciclova Valley, in small populations), *Ailanthus altissima* (Mill.) Swingle (a species present in small populations in Cheile Nerei-Beușnița SCI, at is fringes), *Acer negundo* L., *Helianthus tuberosus* L., *Phytolacca americana* L., *Robinia pseudoacaccia* L.
d) traces of degradation.

Needs for future research

At the scale of whole site, there are various research directions to follow. Among scientific aspects to investigate, those linked to biodiversity management should be favoured. We consider as important research issues related to conservation of 91E0* patches inside the ROSCI0031:

- evaluation of impact of major disturbances - floods, especially in the Nera river basin;
- the impact of climate changes on higrophilous habitats. Is known that alteration of hydrologic regimes encourage the spread of invasive species (PEARCE, 2006, in SCHNITZLER *et al*., 2007);
- elucidate local syndinamical relations between the sub-types of this habitats and with other habitats;
- research of traditional use of rivers' basins resources and their compatibility with conservation goals;
- to determine incentive measures in local communities for conservation.

CONCLUSIONS

1. 91E0* habitat plant communities from ROSCI0031 Cheile Nerei-Beușnița belong to sub-types (EUR 28, DEVILLERS *et al*., 2010) 44.3: *Alno-Padion* și 44.13: *Salicion albae.*
2. Within the ROSCI0031, largest patches 91E0* were found in the Nera and Bei rivers basins.
3. Compared to studies published in 1972 by SCHRÖTT, we recorded a lower specific diversity in willows galleries on Nera and Bei rivers. We can not confirm the presence

of species *Neottia ovata* (L.) Bluff & Fingerh., *Campanula trachelium* L., *Anacamptis palustris* subsp. *elegans* (Heuff.) R.M.Bateman, Pridgeon & M.W.Chase or Veronica crassifolia (= V. spicata subsp. barrelieri (H.Schott ex Roem. & Schult.) Elenevsky).

4. The abundance of *Carex* species (many of them are characteristic to this habitat type) is poor in our recordings.
5. We did not found any species from OPREA's *et al*. (2010) list of 91E0* cormophyte with high conservative value.
6. The main threats upon 91E0* habitats are: D01.01 (paths, tracks, cycling tracks), E03.01 (disposal of household / recreational facility waste) and B06 (grazing in forests/ woodland).

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Annex 1. Cummulative list of vascular plants found within 91E0* patches in the Cheile Nerei-Beuşniţa Site of Community Importance (2012-2013).

Acer campestre L., *Acer platanoides* L., *Achillea millefolium* L., *Aegopodium podagraria* L., *Ajuga reptans* L., *Alnus glutinosa* (L.) Gaertn., *Alopecurus pratensis* L., *Althaea officinalis* L., *Anemone nemorosa* L., *Anemone ranunculoides* L., *Angelica sylvestris* L., *Anthriscus sylvestris* (L.) Hoffm., *Arenaria serpyllifolia* L., *Aristolochia clematitis* L., *Arrhenatherum elatius* (L.) P.Beauv. ex J.Presl & C.Presl., *Arum maculatum* L., *Asarum europaeum* L., *Athyrium filix-femina* (L.) Roth, *Berteroa incana* (L.) DC., *Brachypodium sylvaticum* (Huds.) P.Beauv., *Bromus arvensis* L., *Calystegia sepium* (L.) R. Br., *Capsella bursa-pastoris* (L.) Medik., *Cardamine glanduligera* O.Schwarz, *Cardamine impatiens* L., *Carduus nutans* L., *Carex pendula* Huds., *Carex remota* L., *Carex strigosa* Huds., *Carex vulpina* L., *Carpinus betulus* L.,*Centa urea micrantha* Hoffmanns. & Link, *Centaurea solstitialis* L., *Cerastium arvense* L., *Chelidonium majus* L., *Chenopodium album* L., *Cichorium intybus* L., *Circaea lutetiana* L., *Cirsium arvense* (L.) Scop., *Cirsium lanceolatum* (L.) Hill, *Clematis vitalba* L., *Consolida regalis* Gray, *Cornus sanguinea* L., *Corylus avellana* L., *Crataegus monogyna* Jacq., *Crepis paludosa* (L.) Moench, *Dactylis glomerata* L., *Descurainia sophia* (L.) Webb ex Prantl, *Dianthus armeria* L., *Digitalis grandiflora* Mill., *Dioscorea communis* (L.) Caddick & Wilkin, *Dipsacus pilosus* L., *Dryopteris filix-mas* (L.) Schott, *Echium vulgare* L., *Elymus repens* (L.) Gould, *Equisetum arvense* L., *E. maximum* Lam., *E. palustre* L., *Erigeron annuus* (L.) Pers., *Erysimum odoratum* Ehrh., *Eupatorium cannabinum* L., *Euphorbia amygdaloides* L., *E. cyparissias* L., *E. palustris* L., *Fallopia convolvulus* (L.) Á.Löve, *Festuca arundinacea* Schreb., *Ficaria verna* Huds., *Filago germanica* (L.) Huds., *Filipendula ulmaria* (L.) Maxim., *Fragaria vesca* L., *Fraxinus excelsior* L., *Galeopsis speciosa* Mill., *Galium aparine* L., *G. intermedium* Schult., *G. mollugo* L., *Gentiana asclepiadea* L., *Geranium columbinum* L., *G. phaeum* L., *G. robertianum* L., *Geum urbanum* L., *Glechoma hederacea* L., *G. hirsuta* Waldst. & Kit., *Glyceria maxima* (Hartm.) Holmb., *Hedera helix* L., *Heracleum sphondylium* L., *Holcus lanatus* L., *Holosteum umbellatum* L., *Humulus lupulus* L., *Impatiens noli-tangere* L., *Inula britannica* L., *Iris pseudacorus* L., *Isopyrum thalictroides* L., *Lactuca muralis* (L.) Gaertn., *Lamium album* L., *L. galeobdolon* (L.) L., *L. maculatum* (L.) L., *Lapsana communis* L., *Tanacetum vulgare* L., *Ligustrum vulgare* L., *Lolium perenne* L., *Lotus corniculatus* L., *Lunaria rediviva* L., *Lycopus exaltatus* L.f., *L. europaeus* L., *Lysimachia nummularia* L., *L. vulgaris* L., *Lythrum salicaria* L., *Matteuccia struthioptheis* (L.) Tod., *Medicago minima* (L.) L., *Mentha arvensis* L., *Mentha pulegium* L., *Mercurialis perennis* L., *Milium effusum* L., *Morus alba* L., *Myosotis scorpioides* L., *Nepeta nuda* L., *Oenothera biennis* L., *Orlaya grandiflora* (L.) Hoffm. *Papaver dubium* L., *Parietaria officinalis* L., *Petasites hybridus* (L.) "G.Gaertn., B.Mey. & Scherb.", *Petrorhagia saxifraga* (L.) Link, *Physalis alkekengi* L., *Plantago media* L., *Poa nemoralis* L., *P. pratensis* L., *Polygonatum hirtum* (Bosc ex Poir.) Pursh, *Populus nigra* L., *Potentilla argentea* L., *Prunella vulgaris* L. *Prunus cerasifera* Ehrh.

Prunus avium (L.) L., *Pulicaria dysenterica* (L.) Gaertn., *Pulmonaria officinalis* L., *Ranunculus repens* L., *R. sardous* Crantz, *Reseda lutea* L., *Rorippa sylvestris* (L.) Besser, *Rubus caesius* L., *Rumex crispus* L., *R. sanguineus* L., *Salix alba* L., *S. purpurea* L., *S. triandra* L., *S. viminalis* L., *Salix x fragilis* L.., *Salvia glutinosa* L., *Sambucus ebulus* L., *S. nigra* L., *Saponaria officinalis* L., *Scrophularia nodosa* L., *Silene baccifera* (L.) Roth, *S. latifolia* Poir., *Solanum dulcamara* L., *Sonchus arvensis* L., *Stellaria aquatica* (L.) Scop., *S. holostea* L., *S. media* (L.) Vill., *S. nemorum* L., *Symphytum officinale* L., *Taraxacum campylodes* G.E.Haglund, *Thalictrum lucidum* L., *Thelypteris confluens* (Thunb.) C.V. Morton, *T. phegopteris* (L.) Sloss. ex Rydb., *Tilia platyphyllos* Scop., *Torilis rubella* Moench, *Trifolium campestre* Schreb., *T. pratense* L., *T. repens* L., *Tussilago farfara* L., *Ulmus glabra* Huds., *U. laevis* Pall., *Urtica dioica* L., *Verbascum phlomoides* L., *V. speciosum* Schrad., *V. thapsus* L., *Verbena officinalis* L., *Veronica hederifolia* L., *Viburnum opulus* L., *Vicia hirsuta* (L.) Gray, *Vicia tetrasperma* (L.) Schreb., *Vitis vinifera* L. (*V. sylvestris* C.C.Gmel.), *Xanthium spinosum* L.