Journal of Plant Development
Vol. **25**, Dec **2018**: 145-164
doi: 10.33628/jpd.2018.25.1.145

ISSN 2065-3158 print / e-ISSN 2066-9917
Available online: www.plant-journal.uaic.ro

SALICETUM ALBAE ISSLER 1924 *LEUCOJETOSUM AESTIVI* PÎNZARU SUBASS. NOV. IN THE REPUBLIC OF MOLDOVA

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Abstract: This article is focused on the description of the forests of *Salix alba* L. with *Leucojum aestivum* L., in the valley of Prut River, in the Republic of Moldova. Based on 19 relevés, the author has grouped these forests in a plant community newly described for science – *Salicetum albae leucojetosum aestivi* subass. nov. included in the alliance *Salicion albae* Soó 1951, the order *Salicetalia purpureae* Moor 1958, cl. *SALICETEA PURPUREAE* Moor 1958.

Key words: *Salicetum albae* Issler 1924 *leucojetosum aestivi* subass. nov. characteristic of phytocoenosis, ecology, range, Republic of Moldova.

Introduction

Salix alba L. riverside forests, in the Republic of Moldova, occur in patches in the valleys of the Dniester River and the Prut River, very rarely and along streams in the central part of the country. From 1960 to 1995, willow groves were studied according to the dominant method and grouped into the following associations: *Salicetum* (*albae*) *inundatum* and *Salicetum* (*albae*) *rubosum* (*caesii*) [GHEIDEMAN & al. 1964; PÎNZARU, 1991; POSTOLACHE, 1995].

Since the beginning of the 21st century, the methods of the Central European School [BRAUN-BLANQUET, 1964] have been used in the phytocoenological research on the floodplain forests in the Republic of Moldova. Thus, the *Salix alba* forests from the scientific reserves "Plaiul Fagului" [POSTOLACHE & CHIRTOACĂ, 2005], "Prutul de Jos" [POSTOLACHE & POSTOLACHE, 2012]; "Pădurea Domnească" [TOFAN-BURAC & CHIFU, 2002; POSTOLACHE, 2017] and from the "Nemţeni" forest reserve [COVALI, 2008] have been grouped in the association *Salicetum albae* Issler 1924 (= *Salicetum albae* Issler 1926) [GAFTA & al. 2008].

The association *Salicetum albae* Issler 1924 has been included in the priority habitats, EU code 91E0, cf. Annex 1 Habitats Directive 92/43/EEC.

This article contains the description of a new subassociation of *Salix alba* L. with *Leucojum aestivum* L. *leucojetosum aestivi* Pînzaru subass. nov. as part of the association *Salicetum albae* Issler 1924.

Materials and methods

The phytocoenological studies in the field were carried out in the spring and summer of 2018, in the floodplain of the Prut River, between Nemţeni commune, Hînceşti district, at the north and Sărata Răzeşi commune, Leova district, at the south. For the preparation of this paper, we examined the descriptions of the forest plots from "Amenajările silvice" ("Forest Planning"), 2011-2014, ICAS, Chisinau. Nineteen relevés were described according to the

Received: 24 October 2018 / ***Revised***: 28 November 2018 / ***Accepted***: 30 November 2018

methods of the Central European School [BRAUN-BLANQUET, 1964]. The area of a relevé was 600 m^2, according to the school of Cluj-Napoca [CRISTEA & al. 2004]. The list of species is presented in accordance with recent publications [SÂRBU & al. 2013; PÎNZARU & SÎRBU, 2016]. Air temperature and atmospheric precipitation – according to the Atlas of Climate Resources of the Republic of Moldova [NEDEALCOV & al. 2013]. Information on phytocoenological relevés, published in the Republic of Moldova [TOFAN-BURAC & CHIFU, 2002; POSTOLACHE & CHIRTOACĂ, 2005; COVALI, 2008; POSTOLACHE & POSTOLACHE, 2012; POSTOLACHE, 2017], Romania [CHIFU & MITITELU, 1992; IVAN & al. 1993; GAFTA & al. 2008; CHIFU & IRIMIA, 2014; COLDEA, 2015], Germany [SEIBERT & CONARD, 1992]; Cehia [NEUHÄUSLOVÁ & DOUDA, 2013] and Slovenia [SÍLC, 2003], was examined for comparison.

Results and discussions

The association *Salicetum albae* Issler 1924 includes the phytocoenoses of *Salix alba* L. from the floodplains of rivers and streams in the Central and South-Eastern Europe. The following species are characteristic of the given association: *Salix alba* L., *Salix fragilis* L., *Populus alba* L., *Populus nigra* L., *Fraxinus angustifolia* Vahl, *Acer negundo* L., *Rubus caesius* L., *Urtica dioica* L., *Phalaris arundinacea* L., *Aristolochia clematitis* L., *Humulus lupulus* L., *Iris pseudacorus* L., *Symphytum officinale* L., *Calystegia sepium* (L.) Br. [CHIFU & MITITELU, 1992; SEIBERT & CONARD, 1992; IVAN & al. 1993; SÍLC, 2003; NEUHÄSLOVÁ & DOUDA, 2013; COLDEA, 2015].

Willow forests usually include few species, ephemeral plants are very few or absent. Analysing the list of species of the relevés of the association *Salicetum albae* Issler 1924 [CHIFU & MITITELU, 1992; SEIBERT & CONARD, 1992; IVAN & al. 1993; TOFAN-BURAC & CHIFU, 2002; SÍLC, 2003; POSTOLACHE & CHIRTOACĂ, 2005; COVALI, 2008; POSTOLACHE & POSTOLACHE, 2012; CHIFU & IRIMIA, 2014; COLDEA, 2015; POSTOLACHE, 2017], we didn't find any mention of the presence of summer snowflake (*Leucojum aestivum* L.), although it was cited as a characteristic species of the alliance *Salicion albae* Soó 1930 [SÂRBU & al. 2013]. This mesohygrophylic, geophyte is a central-european-mediterranean-atlantic geoelement, which occurs naturally in hilly areas of several countries and regions: from Spain to Ukraine, Turkey, the Caucasus and Iran. This species is considered characteristic of the coenotaxa *Calthion palustris* Tx. 1937 [ELLENBERG & al. 1992] and *Fraxinetalia* Scamoni et Passarge 1959 [AESCHIMANN & al. 2004].

In the Republic of Moldova, the presence of the species *Leucojum aestivum* L. has been identified only in the willow groves of the valley of Prut River, in the vicinity of Sărata Răzeşi commune, Leova district, and Cioara and Dancu communes, Hînceşti district. It is a critically endangered species (CR), included in the Red Book of the Republic of Moldova [GHENDOV & CIOCÂRLAN, 2015)]. As a result of the phytosociological studies carried out recently, we have found new places where this species occurs – near the communes Nemţeni, Cotul Morii, Leuşeni (near the custom house) and Călmăuţi, Hînceşti district. It grows sporadically or in abundant clusters (AD 2-4) in *Salix alba* L. riverside forests. Under the climatic conditions of the Republic of Moldova, *Leucojum aestivum* plants grow up to 75 cm tall and produce 3-6 leaves, which grow about 75 cm long and 10-16 mm wide. It blooms in April-May, produces by (1) 3-7 (8) pendant flowers, located unilaterally on pedicels of different lengths. The fruits are fleshy, ovate-triangular capsules, 10-25 mm long, 7-17 mm wide, with (1) 3-8 seeds in a fruit. It releases the seeds at the end of June – beginning of July. The seeds are spheroidal, about 6 mm in diameter, blackish. It propagates by seeds and vegetatively (Figure 1).

Figure 1. *Leucojum aestivum* L.: A. flowers – 21.IV.2018, B. fruits – 10.VI.2018

We group the plant communities of *Salix alba* L. with *Leucojum aestivum* L., accompanied by the constant species *Ficaria verna* Huds., *Iris pseudacorus* L. and *Carex riparia* Curtis in a new subassociation within the association *Salicetum albae* Issler 1924 *leucojetosum aestivi* subass. nov.

In Romania, the plant communities of the association *Salicetum albae* Issler 1924 are grouped in two subassociations – *typicum* and *amorphaetosum fruticosae* Morariu et Danciu 1970 [CHIFU & IRIMIA, 2014; COLDEA, 2015] (Table 1).

The manner in which *Salix alba* phytocoenoses, with high abundance of the species *Rubus caesius* L. or *Cornus sanguinea* L s.l.., are grouped is questionable. In Slovenia, these phytocoenoses are separated in subassociations: *cornetosum sanguinei* Wendeberger Zelinka 1952 and *rubetosum caesii* (Soó 1958) Sílc 2003 of the association *Salicetum albae* Issler 1924 [SÍLC, 2003]. While in Romania, some researchers treat them as associations: *Corno sanguinei-Salicetum albae* Dihoru et al. 1966 em. Chifu et Irimia 2014 and *Rubo caesii-Salicetum albae* Doniță et Dihoru 1961 em. Doniță et al. 1966 [CHIFU & IRIMIA, 2014]. On the other hand, other researchers do not recognize these coenotaxa [SEIBERT & CONARD, 1992; IVAN & al. 1993; NEUHÄSLOVÁ & DOUDA, 2013; COLDEA, 2015]. Comparing the lists of the species of these coenotaxa and of the relevés from the Republic of Moldova, we conclude that it is appropriate to group these *Salix alba* forests into a single association – *Salicetum albae* Issler 1924 (Table 1) with the subassociations *typicum*, *amorphaetosum fruticosae* Morariu et Danciu 1970 and *leucojetosum aestivi* Pînzaru subass. nov. (Table 2). In the *Salix alba* riverside forests of the Republic of Moldova, *Rubus caesius* L. and *Cornus sanguinea* L. s.l. often grow abundantly together, for which reason, it has been proposed to consider them as characteristic species of the given association

We include the *Salix alba* L. phytocoenoses from the "Nemțeni" forest reserve, which was included some time ago in the association *Salicetum albae-fragilis* Issler 1926 [nome ambiguum, GAFTA & al. 2008] by V. COVALI (2008), in the subassociation *leucojetosum aestivi*, because *Leucojum aestivum*, a species unregistered by the author, occurs in them (Table 2, rel. 17-18, h.l.). The description of the new coenotaxon is given below.

As. ***Salicetum albae*** Issler 1924 ***leucojetosum aestivi*** Pînzaru subass. nov. hoc loco

T y p e h.l.: Table 2, rel. 9. (Figure 2)

Table synthetic h. l.: Table 2, 19 relevés.

The total area of the subassociation is about 818 ha.

Syn.: *Salicetum albae-fragilis* auct. non Issler 1926, nome ambiguum: Covali, 2008

Locations: Altitude 20-25 m. Relief: the floodplain of Prut River. Soil: alluvial sandy, deep, rich in humus, with high trophicity. Climate – temperate continental, the average annual temperature is 10.5 °C, the average annual precipitation varies between 500 mm and 550 mm (Figure 6).

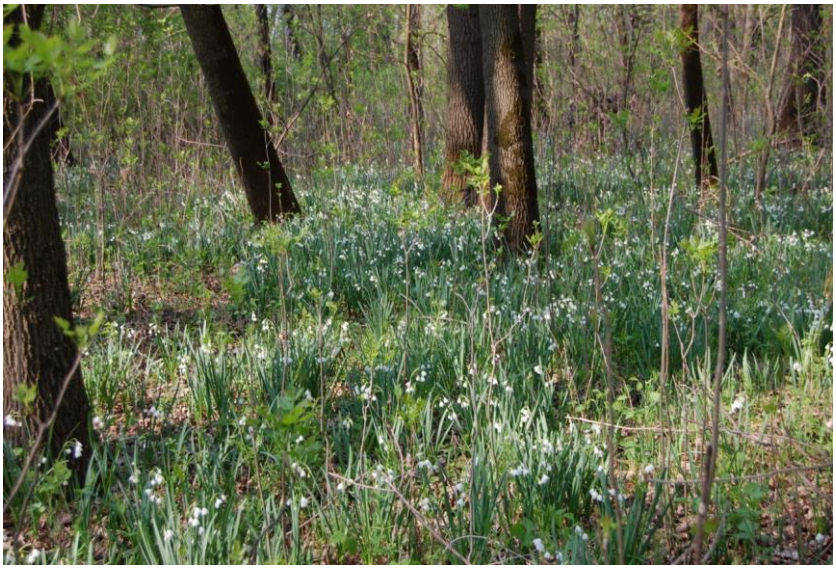

Figure 2. *Salicetum albae leucojetosum aestivi* subass. nov. (typus), Cioara commune, Hîncești district, 22.IV.2018

Characteristic species: *Leucojum aestivum*, *Ficaria verna*, *Iris pseudacorus*, *Carex riparia*, *Salix alba*.

Constant species: *Populus alba*, *Fraxinus excelsior*, *Acer negundo*, *Cornus sanguinea*, *Crataegus monogyna*, *Rubus caesius*, *Glechoma hederacea*, *Lysimachia nummularia*, *Symphytum officinale*, *Stellaria media*, *Urtica dioica*, *Arctium tomentosum*, *Elymus repens*, *Galium aparine*.

Structure: Vertically, three layers are distinguished in phytocoenoses (Figure 2, 3, 5):

1. The tree layer (A1), with a height of about (3-8)14-25 (-30) m, the coverage of the canopy is about 0.6-0.8. This layer consists of the dominant species *Salix alba*, with the cover-abundance (AD) of (1)2-4(5) points, the diameter of the stems varies between (4-14) 20-80 (-100) cm. Accompanying species: *Populus alba*, *Fraxinus excelsior*, *Salix fragilis*, in some places *Populus nigra*, *Quercus robur*, *Fraxinus americana*. The layer A2 is poorly defined, with a height of about 5-10 m: *Acer negundo*, *Pyrus pyraster*, *Malus sylvestris*, *Morus aba*, *Morus nigra*, *Ulmus minor*, *Ulmus glabra*, *Vitis sylvestris*.

Figure 3. *Salicetum albae-leucojetosum aestivi* subass. nov. summer, 18.VI.2018

2. The shrub layer (B) is 1.5-3 m high, unevenly developed, with coverage 10-60 (80) %. Constant species: *Cornus sanguinea*, *Crataegus monogyna*, in some places – *Prunus spinosa*, *Rosa canina*, *Acer tataricum*, *Amorpha fruticosa*; rarely – *Viburnum opulus*, *Coryllus avellana*, *Ligustrum vulgare*, *Euonymus europaeus*. At the level of the shrub layer, there are abundant *Acer negundo*, *Fraxinus excelsior*, *Fraxinus americana*.
3. In the herbaceous cover layer (C), two synusiae can be observed: ephemeroidal and ephemeral. The spring vegetation is very uneven; *Leucojum aestivum* occurs in clusters, accompanied by *Ficaria verna*, *Lamium purpureum*, *Anthriscus longirostris*, *Galium aparine*, *Stellaria media* and *Chaerophyllum temulum*. The summer synusia is richer, with the general coverage varying from (0) 30 to 100 %, such species as *Rubus caesius*, *Carex riparia*, *Glechoma hederacea*, *Elymus repens*, *Lysimachia nummularia* and *Poa palustris* are dominant and constant, but *Iris pseudacorus*, *Symphytum officinale*, *Arctium tomentosum* and *Valeriana officinalis* occur sporadically but constantly.

Floristic composition: in 19 relevés, 113 species of vascular plants have been detected: 11 species are characteristic of the above-mentioned association, another 11 – to the alliance *Salicion albae*, 4 – *Salicion triandrae*, 7 – *Salicetalia* and *Salicetea purpurae*, 7 – *Phragmitetea* s.l., 17 – *Molinio-Arrhenatheretea* s.l., 16 – *Querco-Fagetea* s.l., 8 – *Rhamno-Prunetea* s.l., 32 – Aliae.

Rare species protected by the state: *Leucojum aestivum* L. critically endangered (CR), included in the Red Book of R. Moldova [GHENDOV & CIOCÂRLAN, 2015], *Vitis sylvestris* C.C.Gmel. endangered (EN), included in the Red Book of R. Moldova. [CANTEMIR & ALEXANDROV, 2015] (Figure 4), *Cephalanthera damasonium* (Mill.) Druce, vulnerable (VU), included in the Red Book of R. Moldova [POSTOLACHE Gh & JARDAN, 2015], *Epipactis helleborine* (L.) Crantz, near threatened (NT) *Asparagus pseudoscaber* Grecescu, near threatened (NT), *Viburnum opulus* L. near threatened (NT) [Legea privind fondul ariilor…, Anexa 3, D(a), 1998].

Phytocoenological diversity. Within the given subassociation, in some areas, there is a great abundance of the species *Populus alba* L. (AD = 3-4), which is proposed to be grouped in facies *populosum albae* (Table 2. rel. 3, 6, 7, 14, 17, 19, Figure 5).

Range. The phytocoenoses of the subassociation *leucojetosum aestivi* occupy large areas in Leova (in the vicinity of Sărata-Răzeşi commune) and Hîncești districts (in the vicinity of Cioara, Dancu, Călmăuți, Leușeni, Cotul Morii and Nemțeni communes).

Limiting factors. Clearcutting and uncontrolled logging lead to changes in the composition of the stands, sometimes willow forests are replaced by pure plantations of *Gleditsia tricanthos* L., *Populus nigra* L., *Fraxinus excelsior* L., and the sectors where *Salix alba* is partially eliminated are invaded by *Acer negundo* L. and *Fraxinus americana* L.

Conservation value. These plant communities are of great importance, they represent the only habitat in the Republic of Moldova where *Leucojum aestivum* L. grows.

Conservation status. The phytocoenoses of this subassociation are protected in the Dancu Nature Reserve (131.57 ha) and in the Nemțeni Nature Reserve (20.9 ha) [Legea privind fondul ariilor…, Anexa 4, A, 1998].

Protection measures. It has been proposed include the floodplain forests with the above-mentioned subassociation, found near Sărata-Răzeși, Leușeni and Cotul Morii, in the network of protected areas. During the ecological reconstruction activities, the structure and composition of the tree species characteristic of the association should be improved.

Figure 4. *Vitis sylvestris* C. C. Gmel in the forest near Cotul Morii commune, Hîncești district, 19.VI.2018

Figure 5. Facies *populosum albae* in the "Nemțeni" nature reserve, 10.VI.2018

Figure 6. Locations of the subassociation *leucojetosum aestivi* subass. nov. in the Republic of Moldova

Conclusions

The subassociation *leucojetosum aestivi* Pînzaru represents rare mesohygrophylic phytocoenoses, and its entire range needs to be protected by the state. It is proposed to be included in the List of Rare Plant Associations of the Republic of Moldova.

The phytocoenoses with a great abundance of the species *Populus alba* L. and a rarer presence of the species *Salix alba* L. are proposed to be grouped in facies *populosum albae* (Table 2, rel. 3, 6, 7, 14, 17, 19).

The subassociation *leucojetosum aestivi* subass. nov. should be considered as part of the association *Salicetum albae* Issler 1924, the alliance *Salicion albae* Soó 1951, the order *Salicetalia purpureae* Moor 1958, cl. *SALICETEA PURPUREAE* Moor 1958.

Notes on contributor

Pavel PÎNZARU is a professor, PhD, botanist with a special interest in phytocoenology, floristics and systematics. He has published over 150 scientific papers on the flora and vegetation of Bessarabia and Italy. He is a co-author of the Red Book of the Republic of Moldova (2001, 2015) and The Flora of Bessarabia (volume 1 and 2).

Table 1. Ass. *Salicetum albae* Issler 1924: a - *typicum*, b - *amorphaetosum fruticosae*

Subassociation:	**a**									**b**	
Number of the column	1	2	3	4	5	6	7	8	9	10	11
Number of the relevés	6	12	16	26	86	116	108	83	28	19	18
Number of species											
Constancy (K) or %	K	K	K	K	%	K	K	K	K	K	%
Characteristic species											
Salix alba	V	V	V	V	100	V	V	V	V	II	89
Salix fragilis	III	IV	IV	IV	47	III	V	I	V	I	33
Cornus sanguinea	V	IV	IV	V	27	III	I	I	-	-	28
Rubus caesius	IV	IV	IV	V	5	V	III	V	V	IV	-
Glechoma hederacea	-	I	II	V	38	II	II	I	IV	I	22
Urtica dioica	V	IV	I	V	50	-	II	I	IV	-	28
Vitis sylvestris	-	I	I	IV	6	II	-	I	II	II	44
Diff. subass.											
Amorpha fruticosa	-	-	-	-	9	-	-	I	I	V	72
Xanthium italicum	-	-	-	-	1	-	-	-	-	-	17
Asparagus officinalis	-	-	-	-	1	-	-	-	-	-	22
Asparagus tenuifolius	-	-	-	I	1	-	-	I	-	-	17
Asparagus verticillatus	-	-	-	III	-	-	-	I	II	-	17
Lycopus exaltatus	II	-	-	I	2	-	-	-	-	I	28
Leucojum aestivum	-	-	-	-	-	-	-	-	-	-	-
Iris pseudacorus	-	-	I	-	10	-	I	II	I	I	17
Carex riparia	-	-	-	-	-	-	-	-	-	-	-
Ficaria verna	-	-	-	I	-	-	-	-	I	-	-
Populus alba	-	II	I	III	51	III	II	I	III	-	33
Salicion albae											
Acer negundo	I	III	-	-	1	-	-	-	-	-	-
Valeriana officinalis	-	-	-	-	-	-	I	-	I	-	-
Viburnum opulus	II	I	II	III	10	II	I	I	III	-	17
Humulus lupulus	III	IV	III	V	35	III	II	I	V	-	28
Phalaris arundinacea	-	-	II	-	8	-	-	II	II	II	11
Frangula alnus	-	II	II	IV	8	I	-	I	I	-	28
Galium rubioides	-	-	-	-	-	-	-	I	I	I	-
Silene bacifera	II	II	I	III	8	I	I	I	I	-	11
Salix viminalis	-	I	I	-	14	I	II	I	I	-	-
Persicaria hydropiper	-	II	III	-	15	-	I	II	-	-	-
Salicion triandrae											
Galium aparine	III	II	II	II	28	I	-	II	-	I	-
Lysimachia vulgaris	-	I	I	-	13	II	II	II	-	II	28
Calystegia sepium	III	II	I	III	37	II	II	II	II	-	28
Rumex obtusifolium	-	-	-	IV	9	-	I	-	III	-	22
Salix triandra	-	I	I	II	15	I	I	I	-	-	6
Salix pentandra	-	I		-	-	-	I	-	II	-	-
Aegopodium podagraria	II	-	-	III	3	II	I	-	I	-	17
Epilobium hirsutum	-	-	-	-	-	-	I	-	-	-	-
Elymus caninus	-	-	-	I	5	-	-	-	I	-	-
Rumex crispus	-	-	-	-	I	-	-	I	-	-	-
Salicion elaeagno-daphnoides											
Alnus incana	-	-	-	-	12	-	I	I	-	-	-
Angelica sylvestris	II	-	-	I	8	I	-	I	-	-	-

Calamagrostis pseudophragmites	-	-	-	-	19	-	-	-	-	-	-
Chaerophyllum hirsutum	-	-	-	-	5	-	-	-	-	-	-
Hippophaë rhamnoides	-	-	-	-	-	-	-	-	I	-	-
Myricaria germanica	-	-	-	-	1	-	-	-	-	-	-
Salix daphnoides	-	-	-	I	-	-	-	-	I	-	-
Salix elaegnos	-	-	-	I	6	I	-	-	-	-	-
Saponaria officinalis	-	-	-	-	14	I	I	-	-	-	-
Salicetalia et Salicetea purpureae											
Lysimachia nummularia	IV	III	III	IV	33	II	II	II	III	I	39
Symphytum officinalis	III	II	II	IV	34	II	II	I	IV	II	56
Poa palustris	-	II		-	5	-	I	I	I	-	
Populus nigra	-	II	I	V	45	III	I	I	III	I	78
Solanum dulcamara	II	III	II	IV	30	I	I	-	IV	I	33
Salix purpurea	-	I	I	II	16	-	II	1	I	-	11
Rumex sanguineus	I	I	I	III	3	I	I	I	III	-	22
Anthriscus sylvestris	-	II	II	I	-	-	I	-	-	-	-
Tamarix ramosissima	-		I	-	5	-	-	-	-	-	-
Ranunculus repens	-	I	III	-	47	-	-	-	-	-	50
Stellaria aquatica	-	-	-	V	23	-	I	II	V	I	33
Periploca graeca	-	-	-	-	-	-	-	II	-	-	-
Phragmitetea s.l.											
Phragmites australis	II	I	I	I	13	-	I	I	I	III	44
Carex melanostachya	I	-	-	-	-	-	-	-	-	-	-
Inula helenium	II	-	-	-	-	-	I	-	-	-	-
Eupatorium cannabinum	I	I	-	II	12	I	I	I	I	I	22
Alisma plantago-aquatica	-	-	-	-	-	-	1	-	-	-	-
Alopecurus aequalis	-	-	-	-		-	-	I	-	-	-
Bidens cernua	-	-	I	-	-	-	-	I	-	-	-
Bidens tripartita	-	I	III	I	22	-	I	IV	I	I	22
Bolboschoenus maritimus	-	-	-	-	-	-	-	I	-	I	-
Caltha palustris	-	-	-	-	-	-	-	I	-	-	-
Carex acutiformis	-	-	-	-	-	-	I	I	I	IV	-
Carex vulpina	-	I	I	-	-	-	-	I	I	-	-
Cyperus glomeratus	-	-	-	-	-	-	-	I	-	-	-
Echinochloa crus-galli	-	I	II	I	-	-	-	I	I	-	11
Eleocharis palustris	-	-	-	-	-	-	I	I	-	-	-
Epilobium parviflorum	-	-	-	-	-	-	I	-	-	-	-
Filipendula ulmaria	-	-	-	-	-	-	I	-	-	-	-
Galium palustre	-	-	-	-	3	-	I	IV	I	II	-
Glyceria fluitans	-	-	-	-	-	-	-	I	-	-	-
Glyceria maxima	-	-	I	-	-	-	I	I	-	-	-
Glycyrrhiza echinata	-	-	-	-	6	I	-	I	-	-	17
Leersia oryzoides	-	-	-	-	-	-	-	I	I	-	-
Lycopus europaeus	-	I	I	I	-	-	I	III	-	II	-
Lythrum salicaria	I	I	I	-	35	-	I	III	-	II	17
Mentha aquatica	-	-	I	-	12	-	I	-	I	I	6
Myosotis scorpioides	-	I	-	-	-	I	II	I	I	I	-
Oenanthe aquatica	-	-	-	-	5	-	-	I	-	I	11
Oenanthe silaifolia	-	-	-	-	-	-	-	-	I	-	-
Persicaria lapatifolia	-	-	-	I	-	-	-	I	-	-	28
Persicaria maculosa	-	-	-	-	9	-	I	-	-	-	-

Persicaria mitis	-	-	-	-	-	-	-	I	-	-	-
Ranunculus scleratus	-	-	-	-	-	-	-	I	-	-	-
Rorippa amphybia	-	-	-	I	13	-	-	I	-	-	-
Rumex conglomeratus	-	I	I	I	-	-	I	I	I	-	-
Rumex hydrolapathum	-	-	-	-	-	-	-	-	-	I	-
Sagittaria sagittifolia	-	-	-	-	-	-	-	I	-	-	-
Scirpus sylvaticus	II	-	-	-	-	-	-	I	I	-	-
Scutellaria galericulata	-	I	I	I	21	-	-	I	I	-	-
Senecio paludosus	-	-		-	-	-	-	I	-	-	-
Sium sisarum	I	-	-	-	-	-	I	-	-	-	-
Sonchus oleraceus	-	-	-	-	-	-	-	I	-	-	-
Sparganium erectum	-	-	-	-	-	-	-	I	-	-	-
Stachys palustris	-	-	-	-	12	-	I	IV	I	-	11
Teucrium scordium	-	-	-	-	-	-	-	-	-	II	-
Typha angustifolia	-	-	-	-	-	-	-	I	-	I	-
Veronica anagalis-aquatica	-	-	-	I	-	-	-	-	I	-	-
Molinio-Arrhenatheretea s.l.											
Taraxacum camylodes	-	-	I	-	12	-	I	I	I	I	6
Euphorbia lucida	-	-	-	I	-	-	-	-	I	I	-
Potentilla reptans	-	I	I	-	-	-	II	I	I	I	-
Carex hirta	-	-	-	-	9	-	I	I	I	I	-
Daucus carota	-	-	I	-	13	-	I	I	I	-	-
Prunella vulgaris	-	-	I	II	7	-	I	-	-	-	17
Rorippa sylvestris	-	-	I	II	12	-	I	I	I	II	39
Scutellaria hastifolia	I	-	I	I	-	-	-	I	-	-	-
Thalictrum lucidum	-	-	-	-	-	-	-	I	-	-	-
Trifolium repens	-	-	I	-	15	15	II	-	I	-	-
Cerastium holosteoides	-	-	-	-	-	-	II	-	-	-	17
Equisetum arvense	II	II	-	-	20	-	II	I	I	II	11
Ranunculus polyanthemos	-	-	-	-	-	-	I	-	-	-	-
Trifolium campestre	-	-	-	-	-	-	I	-	I	-	-
Trifolium pratense	-	I	-	-	1	-	-	-	-	-	-
Achillea millefolium	-	-	-	-	1	-	I	I	-	-	-
Agrostis stolonifera	-	II	I	III	30	-	I	III	III	II	72
Alopecurus geniculatus	-	-	-	-	-	-	-	-	I	-	-
Alopecurus pratensis	-	-	-	-	-	-	I	-	-	-	-
Althaea officinalis	-	II	II	IV	10	I	I	I	III	-	28
Anthoxanthum odoratum	-	-	-	-	-	-	I	-	-	-	-
Barbarea vulgaris	-	-	-	-	-	-	I	-	-	-	-
Bellis perennis	-	-	-	-	-	-	I	-	I	-	-
Briza media	-	-	-	-	-	-	I	-	-	-	-
Carex brizoides	-	-	-	-	-	-	I	-	-	-	-
Cardamine pratensis	-	-	-	-	-	-	-	I	-	-	-
Centaurea phrygia	-	-		-	-	-	I	-	-	-	-
Centaurium erythraea	-	-	-	-	-	-	-	-	I	-	-
Centaurium pulchellum				I							
Dactylis glomerata	-	I	I	-	-	-	I	-	-	-	-
Equisetum palustre	-	-	-	I	-	I	-	II	-	-	28
Equisetum telmateia	III	-	-	-	-	-	I	-	-	-	-
Euphorbia palustris	-	-	I	I	-	I	-	-	-	I	-

Festuca pratensis	-	-	-	-	-	-	I	-	-	-	-
Galega officinalis	-	-	-	-	-	-	I	I	-	-	-
Geranium pratense	-	-	-	-	3	-	I	-	-	-	-
Heracleum sphondylium	-	-	-	-	7	-	II	-	-	-	-
Holcus lanatus	-	-	-	-	1	-	I	-	I	-	-
Inula britanica	-	-	-	-	10	-	II	I	-	-	-
Juncus articulatus	-	-	-	-	-	-	I	-	-	-	-
Juncus effusus	-	-	-	-	-	-	I	-	-	-	-
Mentha longifolia	-	I	I	I	16	-	I	I	I	-	11
Plantago major	-	I	-	I	-	-	-	-	-	-	-
Peucedanum carvifolium	-	I	III	-	-	-	-	-	I	-	-
Leucanthemum vulgare	-	-	-	-	3	-	I	I	-	-	-
Lolium perenne	-	-	-	-	1	-	I	-	-	-	-
Luzula campestris	-	-	-	-	-	-	I	-	-	-	-
Lysimachia punctata	-	-	-	-	-	-	-	-	I	-	-
Lythrum virgatum	-	-	-	-	-	-	I	-	-	-	-
Medicago lupulina	-	-	-	-	2	-	-	-	-	-	-
Mentha arvensis	-	-	-	-	-	-	I	-	I	-	-
Pastinaca sativa var. sylvestris	-	-	-	-	-	-	I	I	-	-	-
Petasites hybridus	IV	-	-	-	-	-	I	I	-	-	-
Picris hieracioides	-	-	-	-	-	-	I	-	-	-	-
Poa pratensis	-	-	-	-	-	-	I	-	I	-	-
Poa sylvicola	-	-	-	-	-	-	-	-	I	I	-
Poa trivialis	-	-	-	-	5	-	I	-	I	-	-
Potentilla anserina	-	-	-	I	-	-	I	-	-	-	-
Ranunculus acris	-	-	-	-	12	-	I	-	-	-	-
Ranunculus repens	-	-	-	III	-	-	III	II	II	II	-
Rhinanthus minor	-	-	-	-	-	-	I	-	-	-	-
Rumex acetosa	-	-	-	-	-	-	I	-	-	-	-
Rumex dentatus	-	-	-	-	2	-	-	-	-	-	-
Silene flos-cuculi	-	-	-	-	-	-	I	-	-	-	-
Silene vulgaris	-	-	-	I	-	-	-	I	-	-	-
Stellaria graminea	-	-	-	-	-	-	I	-	-	-	-
Thalictrum flavum	-	-	-	-	-	-	-	I	-	-	-
Thalictrum simplex	-	-	-	-	-	-	I	-	-	-	-
Trifolium hybridum	-	-	-	-	-	-	I	-	-	-	-
Trisetum flavescens	-	-	-	-	-	-	I	-	-	-	-
Vicia cracca	-	-	-	-	13	-	I	I	-	I	-
Querco-Fagetea s.l.											
Fraxinus excelsior	III	-	-	-	-	-	I	-	-	-	-
Quercus robur	-	-	-	I	-	-	-	-	-	-	-
Chaerophyllum temulum	-	-	-	-	-	-	-	-	I	-	-
Malus sylvestris	I	-	-	-	-	-	-	-	-	-	-
Epipactis helleborine	I	-	-	-	-	-	-	-	-	-	-
Convallaria majalis	I	-	-	-	-	-	-	-	-	-	-
Ulmus minor	-	-	-	III	12	I	-	-	I	I	11
Ulmus glabra	-	-	-	-	-	-	-	I	-	-	-
Euonymus europaeus	I	I	-	II	10	I	-	-	I	-	22
Geum urbanum	II	I	I	I	8	-	I	-	I	-	-
Lapsana communis	-	-	-	-	-	-	I	I	I	-	-
Salix cinerea	III	I	-	I	-	-	II	-	-	-	-

Populus tremula	III	-	-	-	-	-	I	-	-	-	-
Cerasus avium	I	-	-	I	-	-	-	-	-	-	-
Acer campestre	-	I	-	II	-	-	-	-	I	-	-
Acer pseudoplatanus	-	-	-	-	-	-	I	-	-	-	-
Ajuga reptans	-	-	I	-	-	-	-	-	-	-	-
Alnus glutinosa	-	-	-	-	-	II	-	I	I	-	-
Arctium nemorosum	-	-	-	-	-	-	-	-	I	-	-
Athyrium filix-femina	-	-	-	-	-	-	I	-	-	-	-
Brachypodium sylvaticum	II	-	I	I	8	-	I	-	-	-	-
Bromus benekenii	I	-	-	-	-	-	-	-	-	-	-
Campanula persicifolia	-	-	-	I	-	-	-	-	-	-	-
Campanula rapunculoides	-	-	-	I	-	-	-	-	-	-	-
Campanula trachelium	-	-	-	-	-	-	-	-	I	-	-
Carex pendula	I	-	-	-	-	-	-	-	-	-	-
Carex remota	-	II	-	-	-	-	-	-	I	-	-
Cardamine impatiens	I	-	-	-	-	I	-	I	-	-	-
Chrysosplenium alternifolium	-	-	-	-	-	-	I	-	-	-	-
Dryopteris filix-mas	-	-	-	-	-	-	I	-	-	-	-
Equisetum hyemale	-	-	-	I	-	-	-	-	I	-	-
Festuca gigantea	-	-	-	I	-	-	-	-	I	-	-
Fraxinus oxycarpa	-	-	-	I	10	-	-	-	I	-	-
Fraxinus pallisae	-	-	I	-	-	-	-	-	-	-	-
Geranium phaeum	II	-	I	-	-	-	I	-	-	-	-
Glechoma hirsuta	I	-	-	-	-	-	-	-	-	-	-
Impatiens noli-tangere	-	-	-	-	-	-	1	-	-	-	-
Lactuca muralis	-	-	-	-	I	-	I	-	-	-	-
Lamium galeobdolon	II	-	-	-	-	-	I	-	-	-	-
Lonicera xylosteum	-	-	-	I	-	-	I	-	-	-	-
Matteucia struthiopteris	-	-	-	-	-	-	I	-	-	-	-
Myosotis sparsiflora	-	-	-	-	-	-	-	-	I	-	-
Platanthera bifolia	-	-	-	-	-	-	-	-	I	-	-
Poa nemoralis	-	-	-	-	-	-	I	-	-	-	-
Pulmonaria officinalis	-	I	-	-	-	-	-	-	-	-	-
Ribes uva-crispi	-	-	-	-	-	-	I	-	-	-	-
Salvia glutinosa	I	-	-	-	2	-	-	-	-	-	-
Sambucus nigra	III	II	I	II	30	I	-	-	-	-	11
Scrophularia nodosa	-	-	-	-	6	-	I	I	I	-	-
Stachys sylvatica	II	-	-	-	-	-	I	-	-	-	-
Staphylea pinnata	-	-	-	-	-	-	-	I	-	-	-
Stellaria nemorum	-	-	-	I	-	-	I	-	I	-	-
Tanacetum corymbosum	-	-	-	I	-	-	-	-	-	-	-
Telekia speciosa	-	-	-	-	-	-	I	-	-	-	-
Tilia cordata	-	-	-	I	-	-	-	-	-	-	-
Tilia tomentosa	-	-	-	-	-	-	-	I	-	-	-
Ulmus laevis	I	-	-	-	-	-	-	I	-	-	-
Ulmus procera	-		-	-	-	-	-	-	I	-	-
Viola odorata	-	-	-	I	-	-	-	-	-	-	-
Viscum album	-	-	-	-	-	-	-	-	I	-	-
Rhamno-Prunetea s.l.											
Crataegus monogyna	III	I	-	IV	35	I	-	I	III	-	11

Prunus spinosa	-	-	-	II	-	-	I	I	I	-	-
Pyrus pyraster	III	-	-	I	-	I	I	I	-	I	-
Corylus avellana	IV	I	-	I	8	I	-	-	-	-	-
Acer tataricum	-	-	-	II	-	-	-	I	I	-	-
Rosa canina	-	II	I	II	20	I	I	I	I	-	-
Ligustrum vulgare	-	-	I	III	16	I	-	I	I	-	17
Clematis vitalba	-	I	I	IV	20	II	-	-	III	-	22
Physalis alkekengi	-	-	I	I	-	-	-	-	I	-	-
Rhamnus cathartica	-	-	I	I	-	-	-	-	-	-	-
Galeopsis pubescens	-	-	-	-	-	-	-	I	-	-	-
Euonymus verrucosus	-	-	-	-	-	-	-	I	-	-	-
Hypericum hirsutum	-	-	-	-	-	-	-	I	-	-	-
Cuscuta monogyna	-	-	-	-	-	-	-	I	-	-	-
Rosa caryophylacea	-	-	-	-	-	-	-	-	I	-	-
Aliae											
Stellaria media	-	I	I	I	-	-	I	I	-	-	-
Arctium tomentosum	-	I	I	-	-	-	I	-	-	-	-
Elymus repens	-	I	-	II	14	I	-	I	I	-	22
Anthriscus longirostris	-	I	-	-	-	-	-	-	-	-	-
Cirsium arvense	-	I	-	-	1	-	I	II	I	-	28
Aristolochia clematitis	-	-	I	I	17	-	I	-	II	-	-
Lathyrus tuberosus	-	-	I	-	-	-	I	-	-	-	-
Vicia hirsuta	-	-	-	-	-	-	-	-	I	-	-
Gleditsia triacanthos	-	-	-	-	-	-	I	-	-	-	-
Alliaria petiolata	-	I	I	I	-	-	I	-	I	-	-
Ballota nigra	-	I	I	-	-	-	I	-	-	-	-
Erigeron annuus	-	I	I	-	22	-	I	I	I	-	11
Robinia pseudacacia	-	-	-	-	-	-	I	I	-	-	-
Morus alba	-	I	I	-	7	-	-	I	-	I	-
Artemisia absinthium	-	I	I	-	3	3	3	I	I	-	-
Leonurus cardiaca	-	I	I	-	-	-	-	-	I	-	-
Tanacetum vulgare	-	-	-	-	1	1	1	I	-	-	-
Plantago major	-	-	-	I	-	-	-	I	I	-	-
Calamagrostis epigeios	-	II	I	IV	-	-	-	I	III	-	-
Vicia tetrasperma	-	-	-	-	-	-	I	-	I	-	-
Lamium maculatum	-	-	-	-	7	7	I	-	I	-	-
Achillea setacea	-	-	-	-	3	-	-	-	-	-	-
Aethusa cynapium	-	-	-	I	-	-	I	-	-	-	-
Agrimonia eupatoria	-	-	-	-	-	-	I	-	-	-	-
Allium vineale	-	-	-	-	-	-	I	-	-	-	-
Arctium lappa	-	-	-	I	15	-	-	I	-	-	-
Armoracia rusticana	-	-	-	-	-	-	I	-	-	-	-
Artemisia austriaca	-	-	-	-	-	-	-	I	-	-	-
Artemisia vulgaris	-	I	I	I	13	-	-	I	I	-	17
Astragalus glycyphyllos	-	-	-	-	-	-	-	I	-	-	-
Atriplex tatarica	-	-	-	-	-	-	-	I	-	-	-
Avena fatua	-	-	-	-	-	-	I	-	-	-	-
Bromus arvensis	-	-	-	-	-	-	-	-	I	-	-
Bromus inermis	-	-	-	-	-	-	I	-	-	-	-
Bromus sterilis	-	-	-	-	-	-	-	-	I	-	-
Calamagrostis arundinacea	-	-	-	-	-	-	I	-	-	-	-

Campanula abietina	-	-	-	-	-	-	I	-	-	-	-
Cannabis sativa	-	I	I	-	-	-	-	-	-	-	-
Cardamine amara	-	-	-	-	-	-	-	I	-	-	-
Carduus acanthoides	-	-	-	-	5	-	I	-	-	-	-
Carduus crispus	-	II	I	II	7	-	I	-	I	-	22
Centaurea micranthos	-	-	-	-	-	-	I	-	-	-	-
Chaerophyllum aromaticum	-	-	-	-	-	-	I	-	-	-	-
Chaerophyllum bulbosum	-	-	I	-	-	-	-	-	-	-	-
Chelidonium majus	-	-	-	I	-	-	I	-	-	-	-
Chenopodium album	-	-	-	-	-	-	-	I	-	-	-
Cichorium intybus	-	-	-	I	1	1	I	-	-	-	-
Cirsium vulgare	-	I	I	-	6	-	I	I	I	-	-
Clinopodium vulgare	-	-	-	I	-	-	I	-	-	-	-
Conium maculatum	-	-	-	I	-	-	I	-	I	-	-
Convolvulus arvensis	-	-	-	-	-	-	I	-	-	-	-
Cruciata laevipes	-	-	-	-	-	I	-	I	-	-	-
Cuscuta lupuliformis	-	-	-	I	-	-	-	-	I	-	-
Cynodon dactylon	-	-	-	-	1	-	-	I	-	I	-
Dipsacus fullonum	II	I	-	-	-	-	-	-	I	-	-
Dipsacus laciniatus	-	-	-	-	-	-	I	-	I	-	-
Dipsacus pilosus	-	I	-	-	-	-	-	-	-	-	-
Dysphania botrys	-	-	-	-	-	-	-	I	-	-	-
Echinocystis lobata	-	-	-	-	16	-	I	I	-	-	-
Echinops sphaerocephalus	-	-	-	-	-	-	-	I	-	-	-
Echium vulgare	-	-	-	-	-	-	I	-	-	-	-
Erigeron acer	-	-	-	-	9	-	-	-	-	-	11
Erigeron canadensis	-	-	-	-	1	-	I	I	I	-	-
Euphorbia cyparissias	-	-	-	-	13	-	I	I	-	-	-
Fallopia dumetorum	-	-	-	I	5	-	-	-	-	-	11
Festuca valesiaca	-	-	-	-	-	-	I	-	-	-	-
Filipendula vulgaris	-	-	-	-	-	-	-	-	I	-	-
Fragaria vesca	-	-	-	I	-	-	I	-	-	-	-
Fraxinus pennsylvanica	-	-	-	-	-	-	-	II	-	-	-
Galeopsis speciosa	-	-	-	-	-	-	-	I	I	-	-
Galeopsis tetrahit	II	-	-	-	-	-	I	-	-	-	-
Galinsoga parviflora	-	-	-	-	-	-	I	-	-	-	-
Galium verum	-	-	-	-	-	-	I	-	-	-	-
Gentiana asclepiadea	-	-	-	-	-	-	I	-	-	-	-
Geranium robertianum	-	-	-	-	-	-	I	-	-	-	-
Helianthus tuberosus	-	-	-	-	-	-	I	-	-	-	-
Hieracium aurantiacum	-	-	-	-	-	-	I	-	-	-	-
Hypericum perforatum	-	-	-	-	-	-	-	I	I	-	-
Lactuca saligna	-	-	-	-	-	-	-	I	-	-	-
Lactuca seriola	-	-	I	-	-	-	-	I	-	-	-
Lamium album	-	-	-	-	-	-	I	-	-	-	-
Leonurus marrubiastrum	-	-	-	-	-	-	-	I	-	-	-
Linaria vulgaris	-	-	-	-	-	-	I	-	-	-	-
Lipandra polysperma	-	-	-	-	-	-	-	I	-	-	-
Lithospermum officinale	-	-	-	-	-	-	-	-	I	-	-
Lotus tenuis	-	-	-	-	-	-	I	-	-	-	-

Medicago falcata	-	-	-	-	-	-	I	-	-	-	-
Mentha pulegium	-	-	-	-	-	-	I	I	-	-	-
Melilotus officinalis	-	-	-	-	-	-	-	I	-	-	-
Oenothera biennis	-	I	-	II	15	I	-	-	II	-	6
Oxalis stricta	-	-	-	-	-	-	-	I	-	-	-
Oxybasis ubrica	-	-	-	-	-	-	-	I	-	-	-
Parietaria officinalis	I	-	-	-	-	-	-	-	I	-	-
Plantago lanceolata	-	-	-	-	10	-	I	-	-	-	-
Plantago media	-	-	-	-	-	-	-	-	I	-	-
Poa annua	-	-	-	I	2	-	-	-	-	-	-
Polygonum aviculare	-	-	-	-	-	-	-	I	-	-	-
Potentilla argentea	-	-	-	-	-	-	I	-	-	-	-
Potentilla recta	-	-	-	-	-	-	-	-	I	-	-
Potentilla supina	-	-	-	I	-	-	-	-	-	-	-
Reseda lutea	-	-	-	-	-	-	I	-	-	-	-
Rumex pulcher	-	-	-	-	-	-	-	I	-	-	-
Sambucus ebulus	-	I	I	-	15	-	-	-	I	-	-
Senecio germanicus	-	-	-	-	-	-	-	I	-	-	-
Senecio sylvaticus	-	-	-	-	-	-	-	I	-	-	-
Setaria pumila	-	-	-	-	-	-	I	-	-	-	-
Setaria viridis	-	-	-	-	1	-	-	-	-	-	-
Silene alba	-	-	-	-	8	-	-	-	-	-	6
Solanum nigrum	-	-	-	-	9	-	I	-	-	-	-
Sonchus arvensis	-	I	-	-	6	-	-	-	-	-	6
Sonchus asper	-		-	-	-	-	I	I	-	-	-
Torilis japonica	-	-	-	I	-	-	-	I	I	-	-
Trifolium fragiferum	-	-	-	-	-	-	I	-	-	-	-
Tussilago farfara	-	I	I	-	3	-	I	-	I	-	-
Verbena officinalis	-	-	-	-	-	-	I	I	-	-	-
Veronica chamaedrys	-	-	-	-	-	-	I	-	-	-	-
Vicia pannonica	-	-	-	-	-	-	-	-	I	-	-
Xanthium spinosum	-	-	-	-	-	-	-	I	-	-	-
Xanthium strumarium	-	I	I	-	6	-	I	I	II	-	6

Ass. ***Saliceum albae*** Issler 1924 [= *Salicetum albae* Issler 1926]:

a. ***typicum*** [= Rubo caesii-Salicetum albae Doniță et Dihoru 1961 em. Doniță et al. 1966; Corno sanguinei-Salicetum albae Dihoru et al. 1966 em. Chifu et Irimia 2014]:

Col. 1. 6 rel. POSTOLACHE Gh & CHIRTOACĂ, 2005 (*Salicetum albae* Issler 1924)
Col. 2. 12 rel. POSTOLACHE Gh. 2017 (*Salicetum albae* Issler 1926)
Col. 3. 16 rel. POSTOLACHE Gh. & POSTOLACHE D., 2012 (*Salicetum albae* Issler 1926)
Col. 4. 26 rel.TOFAN-BURAC & CHIFU, 2002 (*Salicetum albae* Isseler 1924)
Col. 5. 86 rel. COLDEA, 2015 (*Salicetum albae* Issler 1926 *typicum*)
Col. 6. 116 rel. IVAN & al. 1993 (*Salicetum albae* Issler 1924)
Col. 7. 108 rel. CHIFU & IRIMIA, 2014 (*Salicetum albae* Issler 1926 *typicum*)
Col. 8. 83 rel. CHIFU & IRIMIA 2014 (Ass. *Rubo caesii-Salicetum albae* Doniță et Dihoru 1961 em. Doniță et al. 1966)
Col. 9. 28 rel. CHIFU & IRIMIA2014 (Ass. *Corno sanguinei-Salicetum albae* Dihoru et al. 1966 em. Chifu et Irimia 2014)

b. subass. ***amorphaetosum fruticosae*** Morariu et Danciu 1970

Col. 10. 19 rel. CHIFU & IRIMIA, 2014
Col. 11. 18 rel. COLDEA, 2015

Table 2. Ass. *Salicetum albae* Issler 1924 *leucojetosum aestivi* subass. nov.

Relevé no.	1	2	3	4	5	6	7	8	*9	10	11	12	13	14	15	16	17	18	19	K
Surface of relevé (m²)	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	
Altitudine	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	22	22	24	25	
Consistency	0,6	0,6	0,7	0,6	0,6	0,7	0,7	0,6	0,6	0,8	0,6	0,6	0,7	0,7	0,8	0,6	0,8	0,6	0,7	
Tree height (m)	12-16	16-20	18-21	15-17	19-22	18-25	17-24	14	14-16	3-5	21-24	6-24	19-24	19-25	17-19	24-27	8-9	17-21	26-30	
Tree diametr (cm)	24-36	24-34	22-30	20-28	28-36	26-42	24-38	18	16-20	4-7	32-40	10-40	26-38	30-42	24-30	52-80	10-14	30-36	30-60	
Shrub layer coverage (%)	10-30	25	35	45	30	55	15-75	15-40	10-55	25-65	20-45	35	15-45	30-60	30-75	30-80	25-75	10-15	10-30	
Herbaceous layer coverage		60-	45-		60-	70-	60-		35-		60-									
(%)	100	85	90	100	75	90	85	100	90	100	85	100	100	90	100	100	90	90	100	
Number of species	58	28	20	23	35	34	36	28	26	27	45	22	27	17	25	18	26	31	62	
Characteristic species ass. Salicetum albae																				
Salix alba	1-3	1	1	4	3	2	1-3	4	3-4	4	3	1	4	+	3	4-5	1	4	1	V
Cornus sanguinea	2	2	-	-	1-2	1	1-4	2	1-3	2-3	2	1	1	2-3	2-4	1	4	2	2	V
Rubus caesius	3-5	2-4	3-4	2-4	2-3	2-3	2-5	3-5	2-3	2-4	3	3-4	2-4	2-3	1	3-4	2-3	3-4	3-4	V
Glechoma hederacea	2	1	1	1-2	1	3	1-2	1	1-2	3-4	3	1-2	1-2	1-2	3	-	1	2	1-2	V
Urtica dioica	2	1	-	2	2	2-3	2-3	2	2	3	1	2	1	1-4	2-5	1	-	-	3-5	IV
Salix fragilis	1	1	-	-	1	1	1	-	-	-	1	-	-	1	-	-	-	1	1	III
Vitis sylvestris	-	-	-	-	+	+	-	-	-	-	-	-	+	-	+	-	1	1-2	+	III
Char.subass.																				
Leucojum aestivum	1-3	1-3	+	1-2	1-2	+	+	1-3	1-3	1	1-2	1-2	+	3-4	1	1	1-3	1-2	1	V
Iris pseudacorus	+	+	+	1	+	+	+	+	1-2	+	1	+	1	-	+	+	1	1	+	V
Carex riparia	-	-	-	1-2	-	2	2	2-3	2	-	2	2	2	-	2	-	3	3	2	IV
Ficaria verna	2-3	2	1-4	2	1	1-2	2-3	1	2	3-4	3	2	-	2	1	1	-	-	-	IV
Diff. facies																				
Populus alba	-	1	4	-	1	2-3	3-4	+	+	1	2	1	-	4	1-2	1-2	4	-	4	IV
Salicion albae																				
Acer negundo	1	1	1	1-3	1	3	1	1	-	1-2	2	+	+	1	1	-	1	-	3	V
Valeriana officinalis	+	+	+	+	+	-	+	1-2	-	-	+	-	-	-	-	-	-	-	-	III
Viburnum opulus	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	+	+	II
Humulus lupulus	1	-	1	-	+	-	-	-	-	1-2	1	-	-	-	+	-	1	-	-	II
Phalaris arundinacea	-	-	-	-	-	-	-	-	-	-	I	-	2	-	-	-	1	-	-	II

Amorpha fruticosa	+	-	-	-	-	-	-	-	1	2	-	-	1-2	-	-	-	1	-	-	II
Frangula alnus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	r	-	I
Viola elatior	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	+	I
Galium rubioides	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	2	I
Asparagus pseudoscaber	r	-	-	-	r	-	-	-	-	-	+	-	-	-	-	-	-	r	-	I
Silene bacifera	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	I
Salicion triandrae																				
Galium aparine	2	1	1	1	1	3-4	1-2	1	1-2	2	2	1-2	-	2	3	2-3	1	-	1	V
Lysimachia vulgaris	-	-	-	+	+	-	-	-	-	-	+	-	+	-	-	-	-	+	-	II
Calystegia sepium	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	I
Rumex obtusifolium	+	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	+	I
Salicetalia et Salicetea purpureae																				
Symphytum officinalis	+	1	+	+	+	+	+	+	+	+	+	-	+	-	+	+	1	+	+	V
Lysimachia nummularia	2	-	-	-	2	2	2	2-3	2	-	2	2-3	2	2	2-3	-	2	3	2	IV
Poa palustris	2	-	-	-	1-2	1-2	-	3	-	-	1	3	1	-	-	-	-	-	1	III
Populus nigra	1-3	+	-	-	1-2	1	-	-	2	-	1	-	1-2	-	-	-	-	-	-	II
Solanum dulcamara	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	I
Salix purpurea	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	I
Rumex sanguineus	-	1	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	I
Phragmitetea s.l.																				
Phragmites australis	-	-	-	-	-	-	2	-	-	3	-	-	-	-	1	-	-	-	1	II
Carex melanostachya	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1-2	-	-	-	-	I
Epilobium ciliatum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	I
Inula helenium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	r	-	I
Eupatorium cannabinum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	I
Rorippa austriaca	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	I
Alisma plantago-aquatica	+	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-		+	I
Molinio-Arrhenatheretea s.l.																				
Taraxacum camylodes	+	-	-	-	-	+	+	+	+	+	-	+	-	-	+	+	-	-	-	III
Euphorbia lucida	+	-	+	-	+	-	+	-	-	+	+	-	1	-	+	-	-	+	+	III
Phleum pratense	-	-	-	-	-	+	-	-	1	2	-	-	+	-	-	-	-	-	1	II
Potentilla reptans	-	-	-	-	-	-	-	-	1	+	-	-	1-2	-	-	-	-	-	2	II
Carex hirta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	-	-	1-2	I
Daucus carota	+	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	I
Prunella vulgaris	+	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	+	I
Rorippa sylvestris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	I

Scutellaria hastifolia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-		I
Thalictrum lucidum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1		I
Vicia sepium	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		I
Trifolium repens	-	1	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-		I
Cerastium holosteoides	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-		I
Equisetum arvense	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	2	-		I
Ranunculus polyanthemos	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+		I
Trifolium campestre	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+		I
Trifolium pratense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+		I
Querco-Fagetea s.l.																					
Fraxinus excelsior	-	3	1	1	2	-	-	-	-	-	1	3	-	1	1	1	-	1	+		IV
Quercus robur	1-2	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	1	1	1		II
Chaerophyllum temulum	+	-	-	-	+	-	-	-	-	-	+	-	-	+	-	-	1	-	1		II
Malus sylvestris	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-		I
Cephalanthera damasonium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	r		I
Epipactis helleborine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	r	-	r		I
Convallaria majalis	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2		I
Carex contigua	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1		I
Ulmus minor	-	-	1	-	-	1-2	1-2	-	-	-	-	-	-	-	-	-	-	-	1		I
Ulmus glabra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1		I
Euonymus europaeus	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		I
Geum urbanum	1	+	+	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-		I
Lapsana communis	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+		I
Salix cinerea		-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		I
Populus tremula	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-			I
Polygonatum latifolium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-			I
Rhamno-Prunetea s.l.																					
Crataegus monogyna	2	2	2	+	1	1	1	1-2	-	+	1	+	-	1	+	1	+	+	1		V
Prunus spinosa	+	-	-	-	+	1	1-3	1	1	1-3	+	1	-	-	-	-	-	-	1		III
Pyrus pyraster	+	+	-	+	+	+	1	+	+	+	+	-	+	-	-	-	-	-	-		III
Corylus avellana	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+		I
Acer tataricum	1	-	1-2	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-		I
Vicia tenuifolia	-	-	-	+	+	-	-	-	-	-	-	-	2	-	-	-	-	-	1-2		I
Rosa canina	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-		I
Ligustrum vulgare		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-		I
Aliae																					
Stellaria media	1	1-2	1	1	1	2-3	1-2	1-2	2-3	2-3	2	1-2	-	2	-	2	-	-	-		IV

Arctium tomentosum	+	+	-	-	+	+	-	+	+	-	+	+	-	+	+	-	+	-	+	IV
Elymus repens	2	2-3	2	3-4	3-4	-	3-4	3	4	-	-	-	2-3	-	-	-	-	3	3-4	IV
Morus nigra	+	-	-	-	-	-	1	-	-	+	+	+	+	-	+	-	+	+	+	III
Lamium purpureum	2	-	-	-	-	1	+	1	1-3	2-3	+	-	-	-	1-2	+	-	-	-	III
Anthriscus longirostris	1-3	-	-	-	3	2-3	2	1	-	1-2	+	-	-	-	2	-	-	-	2	III
Cirsium arvense	+	-	-	-	-	+	+	+	-	-	+	-	-	-	-	+	-	-	+	II
Aristolochia clematitis	2	-	-	-	1	-	2	2	-	-	-	-	-	-	-	-	2	2	2	II
Euphorbia virgata	+	+	-	-	-	-	+	-	+	-	-	-	+	-	-	-	-	-	-	II
Valerianella carinata	-	-	-	-	-	+	+	1	+	-	-	-	-	-	-	-	-	-	-	II
Lathyrus tuberosus	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	II
Vicia hirsuta	+	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	+	-	II
Gleditsia triacanthos	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	I
Alliaria petiolata	-	-	-	-	-	-	+	+	-	3	-	-	-	-	-	-	-	-	-	I
Ballota nigra	+	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	I
Erigeron annuus	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	I
Torilis arvensis	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	I
Robinia pseudacacia	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	I
Morus alba	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	I
Fraxinus americana	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	I
Artemisia absinthium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	I
Leonurus cardiaca	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	I
Tanacetum vulgare	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	I
Plantago major	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	I
Cardaria draba	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	I
Verbascum blattaria	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	r	I
Lathyrus sylvestris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	I
Calamagrostis epigeios	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	I
Odontites vulgaris	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	I
Vicia tetrasperma	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	I
Lamium maculatum	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	I
Equisetum ramosissimum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	I
Plantago lanceolata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	I

Place and date of the relevés: rel. 1-2, Călmăuți commune, Hîncești district, 22.IV.2018, 12.V.2018, 22.VIII.2018; rel. 3-6, Dancu commune, Hîncești district, 22.IV.2018, 22.VIII.2018; rel. 7, 8, *9 (typus), 10, Cioara commune, Hîncești district, 22.IV.2018; 22.VIII.2018; rel. 11 Leușeni commune, Hîncești district, 19.VI.2018; rel. 12-15, Sărata-Răzeși commune, Leova district, 24.IV.2018, 13.V.2018; rel. 16-17, Cotul Morii commune, Hîncești district, 19.VI.2018; rel. 18-19, Nemțeni commune, Hîncești district, 10.VI.2018. facies populosum albae: rel. 3, 6, 7, 14, 19.

References

AESCHIMANN D., LAUBER K., MOSER D. M. & THEURILLAT J. P. 2004. *Flora alpina.* Bologna: Zanichelli.Vol. **2**, 1188 pp.

BRAUN-BLANQUET J. 1964. *Pflanzensoziologie. Grundzüge der Vegetationskunde*. Ed. 3. Wien: Springer Verlag, 865 pp.

CANTEMIR V. & ALEXANDROV E. 2015. *Vitis sylvestris* C.C.Gmel. Pp. 114. In: *Cartea Roșie a Republicii Moldova – The Red Book of the Republic of Moldova.* Col. red. acad. Gh. DUCA. Edit. 3, 2015. Chișinău: Știința, 492 pp.

CHIFU T. & IRIMIA I. 2014. *Salicetea purpureae* Moor 1958. Pp. 7-44. In: CHIFU Th. (eds) *Diversitatea fitosociologică a vegetației României.* Part. III. *Vegetația pădurilor și tufărișurilor*. Iași: Institutul European, 551 pp.

CHIFU T. & MITITELU D. 1992. Vegetația Moldovei. Vegetația de luncă. Pp 77-81. In: DONIȚĂ N., IVAN D., COLDEA G., SANDA V., POPESCU A., CHIFU Th., PAUCĂ-COMANESCU M., MITITELU D. & BOȘCAIU N. 1992. *Vegetația României*. București: Edit. Tehnică Agricolă, 407 pp.

COLDEA Gh. 2015. Ass. *Salicetum albae* Issler 1926. Pp. 15. Tab. synt. 1, col. 2a, 2b. In: COLDEA Gh. (eds) *Les associations végétales de Roumanie.* Tome 3. *Les associations forestiéres et arbustives*. Cluj-Napoca: Presa Universitară Clujeană, 281 pp.

COVALI V. 2008. Floristic and phytocoenotic biodiversity of protected area Nemțeni (R. Moldova). *J. Plant Develop*. **15**: 69–76.

ELLENBERG H, WEBER H. E., DÜLL R., WIRTH V., WERNER W. & PAULIßEN D. 1992. *Zeigerwerte von Pflanzen in Mitteleuropa*. Göttingen: Erich Goltze KG, 258 pp.

GAFTA D., NICULESCU M., OPREA A., SÂRBU I., COLDEA G. & ALEXIU V. 2008. Păduri temperate europene. 91E0 Păduri aluviale. Pp.70. In: *Manual de intrepetare a habitatelor Natura 2000 din România*/ Dan GAFTA & Owen MOUNTFORD (coord.). – Cluj-Napoca: Risoprint.101 pp.

GHEIDEMAN T. S., OSTAPENKO B. F., NICOLAEVA L. P., ULANOVSKIJ M. S. & DMITRIEVA N. V. 1964. *Tipy lesa i lesnye assotziatzii Moldavskoj SSR.* Kišinev: Cartea moldovenească, 268 pp.

GHENDOV V. & CIOCÂRLAN N. 2015. *Leucojum aestivum* L. Pp. 124. In: *Cartea Roșie a Republicii Moldova – The Red Book of the Republic of Moldova.* Col. red. acad. Gh. DUCA. Ed. 3, 2015, Chișinău: Știința, 492 pp.

IVAN D., DONIȚĂ N., COLDEA Gh., SANDA V., POPESCU A., CHIFU Th., BOȘCAIU N. MITITELU D. & PAUCĂ-COMANESCU M. 1993. Végétation potentielle de la Roumanie. Braun-Blanquetia. Recueil de travaux de geobotanique reliew of geobotanical monographs. Camerino. **9**: 79.

NEDEALCOV M., RĂILEAN V., CHIRICĂ L. & al. 2013. *Atlas. Resursele climatice ale Republicii Moldova = Atlas . Climatic resources of the Republic of Moldova*. Chișinău: Î. E. P. Știința, 76 pp.

NEUHÄUSLOVÁ Z. & DOUDA J. 2013: KAC01 *Salicetum albae* Issler 1926. Pp. 64-66. In: CHYTRÝ M. (ed.), *Vegetace České republiky.* 4. *Lesní a křovinná vegetace* [*Vegetation of the Czech Republic 4. Forest and shrub vegetation*]. Praha: Academia. 552 s.

PÎNZARU P. & SÎRBU T. 2016. *Flora vasculară din Republica Moldova. (Lista speciilor și ecologia).* Chișinău: Tipografia UST, 261 pp.

PÎNZARU P. Ia. 1991. *Sredne*p*ridnestrodskie lesa Moldovy* (*fitotzenologhia, tipologhia, flora, ohrana*) 03.00.05 – botanica. Avtoreferat diss. kand. nauk. Kišinev, 25 pp.

POSTOLACHE G. 1995. *Vegetația Republicii Moldova*. Chișinău: Știința, 340 pp.

POSTOLACHE G. 2017. *Rezervația „Pădurea Domnească*". Chișinău: Combinatul Poligrafic, 256 pp.

POSTOLACHE G. & CHIRTOACĂ V. 2005. Vegetația. Pp.167-223. In: *Natura rezervației „Plaiul Fagului*". Sub red. acad. A.URSU. Chișinău-Rădenii Vechi, 431 pp.

POSTOLACHE G. & JARDAN N. *Cephalanthera damasonium* (Mill.) Druce. Pp. 152. In: *Cartea Roșie a Republicii Moldova – The Red Book of the Republic of Moldova.* Col. red. acad. Gh. DUCA. Ed. 3, 2015, Chișinău: Știința, 492 pp.

POSTOLACHE G. & POSTOLACHE D. 2012.Vegetația. Pp. 50-86. In: POSTOLACHE Gh, MUNTEANU A., POSTOLACHE D. & COJAN C. *Rezervația "Prutul de Jos".* Chișinău: Tipografia Centrală, 152 pp.

SÂRBU I., ȘTEFAN N. & OPREA A. 2013. *Plante vasculare din România. Determinator ilustrat de teren.* București: Edit. Victor B Victor, 627 pp.

SEIBER P. & CONARD M. 1992: Ass. *Salicetum albae* Issler 1926. A. Textbland, Pp. 22-23. B. Tabellenband, Tabelle 241. Assoziation Nr. 6, Pp.11-12. In: OBERDORFER E. (eds) *Süddeutsche Pflanzengesellschaften* . Teil IV. *Wälder und Gebüsche*. Gustav Fischer Verlag, Jena. A. Textband, 282 pp. B. Tabellenband, 580 pp.

SÍLC U. 2003. Vegetation of the class *Salicetea purpureae* in Dolenjska (SE Slovenia). *Fitosociologia.* **40**(2): 3-27.

TOFAN-BURAC T. & CHIFU T. 2002. *Flora și vegetația din valea Prutului*. Iași: Edit. CORSON, 437 p.

*** *Legea privind fondul ariilor naturale protejate de stat* Nr. 1538 din 25.02.1998. Monitorul oficial din 16.07.1998, Nr. 066 art. Nr. 442.

How to cite this article:

PÎNZARU P. 2018. *Salicetum albae* Issler 1924 *leucojetosum aestivi* Pînzaru subass. nov. in the Republic of Moldova. *J. Plant Develop.* **25**: 145-164. https://doi.org/10.33628/jpd.2018.25.1.145