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The Flora of the Csömör pool

By

E. STOLLMAYER-BONCZ

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Abstract: There is a pool in the district of Csömör village, Pest county, surrounded by agricultural territory. There is a "island" which gives a home to many species, known only from some peat-bogs in Hungary. These and other plants are surveyed by the author.

The natural geographical conditions of the Csömör pool and its surroundings

The small pool near the Csömör can be found in the left-side lateral valley of the stream Forrás, surrounded by agricultural territories. It is marked by the OMMI genetic soil map as agriculturally untillable land. It cannot be found on maps, probably because of its dimension. There is a strip of water side land of varying width and diversified microrelief, leading from the road to the shore. There is not much open water, however, in spring and summer it makes getting onto the island more difficult. The island itself is a botanically unexploited Sphagnum moor of varied flora.

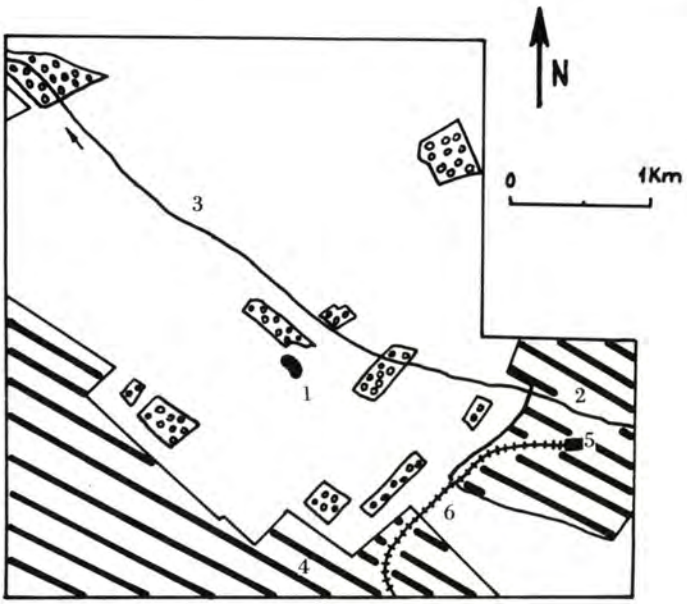
From a botanic point of view the newly explored territory can be found on the northern Pest-Plain part of the Dunamenti-Plain of varied relief, broken by alluvial aprons in the left-side lateral valley of the stream Forrás or Csömör. The stream Forrás is one of the third-rate, left-side affluents of the Danube; its water runs into the stream Mogyoród which is the right-side current of the stream Szilas (Table 1).

Table 1. The most important characteristics of the Pest-Plain:

Its territory:	700 km^2
Mean annual temperature:	10°C
Annual precipitation:	600 mm
Annual evaporation:	525 mm
Annual outlet:	2.5 $l/sec/km^2$

The currents of the territory (the Rákos, Szilas, Csömör or Forrás and Mogyoród streams) are fed by springs seeping through the surface of Pliocene-Miocene strata on its eastern border (Marosi & Szilárd 1967).

The pH of the pool's water was 6.5 to 7.0, determined by universal test paper at the spot. The stream Forrás takes its source in the side of the bench No. 5 of the Danube without an



Map 1.

The sketch map of Csömör pool

1. Csömör pool, 2. village Csömör, 3. Csömör brook, 4. 16th district of Budapest, 5. suburb railway terminus, 6. suburb railway, 7. forest.

This is the detail of the Budapest 1971-601-949/IV map from Cartographia. The lake was marked by B.E. Ákos Stollmayer.

overflow and it flows across Csömör village which is east of the territory under survey. The valley itself is placed on the bench No. 3 of the Danube of mid-Pleistocene, 34 meters above the zero point of the Danube, north of the bench No. 4 without an overflow (Map I).

The valley of the stream Forrás is covered by meadow, boggy soils where mainly hayfields can be found.

The floristic territorial division of the Csömör pool

The surroundings of the Csömör pool belongs to the Praematricum district of the Europannonicum floristic region of the Pannonian sector (Pannonicum) within the Central European province of the holarctic realm. The territory is botanically unexplored. While there are a lot of data of herbarium and BORBÁS's work (1879) about the plants of the valley of the stream Rákos, only the Amblystegium riparium is mentioned by Borbás of all the plants of the fields of the stream Forrás.

The obscurity of the region may be explained by the fact that the pool is small, about 0.5 hectare, there is not much open water and is completely surrounded by agricultural territories. Only its northern side is in contact with the meadow of the narrow valley of the stream Forrás. There is an "island" to be found in the middle of the pool.

A dirt road divides it from the surrounding agricultural territories; it can be walked round on the road.

The author's attention was called to it by her students, among them especially by Zoltán Gerendás in May, 1976 when he brought Utricularia species to a biology class and mentioned the mosses of the "island", too. Some mentioned the birds of the pool as well. In early June, 1976 when there was little water in the pool, the author and her students could penetrate the "island". The great number of Sphagnum sp. and Lastrea thelypteris surprised them.

On request Dr. András Horánszky botanist of the Eötvös Loránd University had a look at the territory in June, 1976. After having looked around the region, he made a short report of the territory under the title: "New Sphagnum moor in Hungary" on March 22, 1977 at the 1051st session meeting of the HBS Hungarian Botanic Society's Botanic Section, without more exact determination of position. He proposed the Pest County Council to preserve the Csömör pool, discovered by the students of the Szerb Antal Secondary School. It was the author in 1976 who started the floristic exploration of the territory in detail. The herbarium, certifying the flora work was offered by her to the botanical collection of the Museum of Natural Science.

While exploiting the territory, the gathering of species was done by proceeding from the road, encircling the pool towards the open water. The representation of results is done in the same arrangement. The following reference books were used by me for identifying the species and naming them; "The Mosses of Hungary" by Á. BOROS (1953), "The Plant Identification Handbook" by SOÓ & KÁRPÁTI (1968) and in classing the flora elements "The Taxonomic and Phytogeographical Handbook of the Hungarian Flora and Vegetation", and Bryogeographie und Bryoflora Ungarns by Á. BOROS (1968).

The author assorted the species according to the geographic structure of the area, i.e. those living on the side of the road (Table 3 loc. 4), on the water side (Table 3 loc. 1), in the water (Table 3 loc. 2) and on the island (Table 3 loc. 3). The author denotes the estimated frequency of the species as rare, frequent and abundant.

The plants of the pool and its immediate surroundings

The plants of the weed stands of the road side

On the side of the road encircling the lake the weed vegetation is different because of the varying configuration of the terrain and the different plant teams nearby according to each cardinal point.

The western shore is steeper, the strip of land on the water side is narrower, there are many reedy areas, areas of willow bushes and bramble canes. Thus weeds are driven back to the strip of land along the road which means 20-50 cm. The northern side is open towards the field with very few species of weeds. The eastern side is getting flatter towards the agricultural territory, the road is at a distance from the lake. The territory here is broad and very shady with willow trees, bramble canes and sedges, and is partly flooded in case of high water. Therefore territories with weeds are narrow. On the southern side the beginning of the "lateral" valley can be found which is damp and shady with willow trees and it has become overgrown with weeds to the least extent. (Amaranthus retroflexus, Ambrosia elatior, Artemisia vulgaris, Cannabis sativa, Cenchrus pauciflorus, Cirsium arvense, Convolvulus arvensis, Erigeron canadensis, Hibiscus trionum, Melandrium album, Plantago major, Polygonum patulum, Salsola kali, Sonchus arvensis, Agropyron repens, Cynodon dactylon, Setaria viridis).

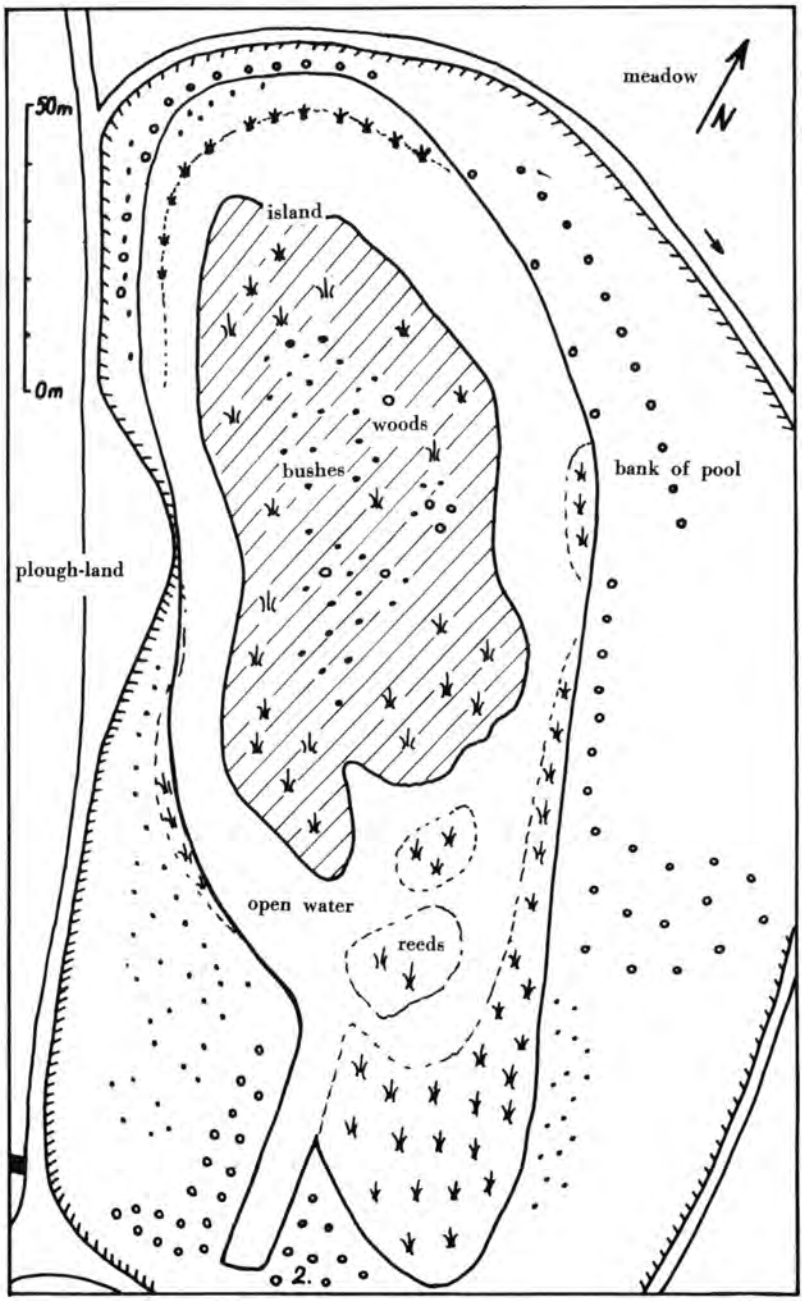
The plants of the water side

The configurations of the terrain, water supply and the distance from the agricultural territory have made it possible that along the water side around the lake a diversity of territories could be formed both from the point of view of scenery and phytocenology. Especially species belonging to the phytosystematic unities of Molinietalia, Phragmitetea, Magnocaricion and Populetalia. The open water reaching the water side can only be found on the northern side. Here a group of Populus nigra ssp. pyramidale, presumably planted can be found beside the road together with the marshland plants of the valley of the Stream Forrás or Csömör. The island can be seen the best from here (Fig. 1).

The western side of it is occupied, along a narrow strip, by reeds, willow bushes and sedges. Open water is only on a small space, beside a fallen, once huge Salix triandra. On the eastern side there is a stand of beautiful Lastrea thelypteris on a broad strip of land in the shade of large willow trees. This territory is partly flooded in spring and autumn. After the flood has subsided, the roots and branches of the willow trees are covered by a moss carpet of Amblystegium riparium (Fit. 2). Among the large species belonging to Magnocarion the winter frost and the icy storms cause much damage in the old willow trees. The vegetation completely overgrows the broken off, crumbling branches covered with tinders. On the south-eastern, southern and south-western side first a reedy marsh and bulrushes, then willow bushes (Salix cinerea, Salix triandra), poplar bushes and trees (Populus alba, P. nigra, P. tremula), then willow trees (Salix triandra) under them a territory with sedges (Carex elata, C. gracilis, C. riparia) with lots of horsetail (Equisetum arvense) can be found on a broad strip. The Rubus caesius covers everything, the reeds are overgrown by Calystegia sepium. The water side is made livelier by Eupatorum cannabium, Cirsium canum, Epilobium hirsutum, Lysimachia vulgaris, Lythrum salicaria, Mentha aquatica, Myosotis palustris, Solanum dulcamara and Symphytum officinale. The list of water side plants can be seen in Table 3 with the indication of the habitat and estimated frequency.

Plants in the water

There is not much open water (Map 2). The water is deeper on the northern side, here the open water is covered by the white Batrachium trichopyllum and the yellow Utricularia vulgaris in the bloom period. As for the other parts of the surface narrow, winding water surfaces shimmer round the island. The yellow-flowered Rorippa amphibia can be detected among the reeds and bulrushes. Phragmites communis, Typha angustifolia and T. latifolia can be found in little patches here and there, and inwards from the water side on the shallower south-eastern, southern and south-western part. In some places the leaves of the Lemna minor, L. trisulca, Polygonum amphibium, f. aquaticum and Potamogeton natans, cover the water. In spring much alga can be found. The species list of the water surface is in Table 3. The species belong to the phytosystematic groups of Hydrochari-Lemnetea, Potametalia and Phragmitetalia.



Map 2. The topography and flora of Csömör pool

The plants of the island

There is a sudd with the dimension of about two-fifth of the pool nearer the western shore of the pool which gradually turns into the open water, especially on the eastern, south-eastern and southern part. On it the "basis" is given by the roots of Salix cinerea and the low Populus tremula, the stolons of the Phragmites communis and the rhizomes of Lastrea thelypteris (Fig. 3). Over them a thick moss carpet can be found. In some places the fen window makes "going" dangerous. Even in the dry weather the island is very damp, one should carefully go round, even in boots. The children in the neighbourhood trod paths on the island, looking for aquatic animals. The light blossoms of Lastrea thelypteris and the abundant Epipactis palustris (Fig. 4) are a fascinating sight in summer. The special value of the "island" is the many species of moss. The most abundant is the rare Sphagnum squarrosum (Fig. 5) on the northern side and Thuidium lanatum (Helodium blandowii). Many other rare species of moss can be found here such as Scorpidium scorpioides, Sphagnum fimbriatum, S. recurvum, Climacium dendroides, Conocephalum conicum, Lophocolea heterophylla, Plagiomnium affine - all being rare in the Great Plain. On the southern side of the island especially Amblystegium riparium and Calliergon cuspidatum can be found. The list of species of the island and their frequency is held by Table 3. The division of species according to flora elements can be seen in Table 3.

The percentage distribution of the flora elements of the Csömör pool differs from the national one. This is especially striking in the case of mosses, which can be attributed to the great number of rare species of moss. The high percentage of cosmopolitan species on the roadside is caused by the many kinds of weeds in little entities. The percentage of circumpolar, Eurasian, European species is higher, the presence of Central European, Continental and Pannonian (Endemic) species in p.c. is lower than the national one (Table 2).

Table 2. The percentage distribution of the flora elements

Flora elements	Hungary		Csömör pool			
	Mosses	Ferns and Angiospermae	Mosses		Ferns and Angiospermae	
	%	%	specimen	%	specimen	%
Cosmopolitan	6.8	6.1	1	5.8	18	15.9
Adventiv	-	2.45	-	-	4	3.5
Circumpolar	54.2	8.1	14	82,3	24	21.1
Eurasian	-	22.5	-	-	46	40.7
European	-	8.48	-	-	14	12.3
Central European	-	11.97	-	-	4	3.5
Continental	-	7.73	-	-	2	1.7
Boreal	7.5	-	2	11.7	-	-
Pannonian (endemic)	-	1.93	-	-	1	0.8
			17		113	99.7

During the floristic exploration many rare species of moss were found, therefore it is justified that the lake should be preserved as a national nature reserve.

The presence of new species of moss is still expected, the alga flora has not been explored yet. Its charming scenery makes it also outstanding. It can be feared that the diminishing green belt of the capital, the outgoing crowds of people, the ever growing intensive agriculture endangers this preserved, tiny marshland.

Acknowledgements. My thanks to Dr. András Horánszky who was so kind as to have a look at the pool at our request and reported it in the first place in the Botanic Section. My thanks to the scientists of the Botanical Department of the Hungarian Natural History Museum who rendered me all administrative and professional help in my work (Konstantin Z. Dobolyi, Dr. Lilla Hably, Dr. Zsuzsa Komáromy, Tibor Szerdahelyi, György Szollát). I owe gratitude to László Vajda who controlled the mosses, already identified and identified many species.

Table 3.

Flora elements	Species	Locality				Estimated frequency record			
		1	2	3	4	1	2	3	4
	Bryophyta								
Circ.	Amblystegium riparium	+	-	+	-	R	-	A	-
Circ.	Brachythecium salebrosum	-	-	+	-	-	-	R	-
Circ.	Bryum weigelii	+	-	-	-	R	-	-	-
Circ.	Calliergon cuspidatum	-	-	+	-	-	-	A	-
Circ.	Catharinaea undulata	+	-	-	-	R	-	-	-
Circ.	Chrysohypnum stellatum	-	-	+	-	-	-	R	-
Circ.	Climacium dendroides	-	-	+	-	-	-	R	-
Circ.	Conocephalum conicum	-	-	+	-	-	-	R	-
Cosm.	Funaria hygrometrica	+	-	-	-	R	-	-	-
Circ.	Lophocolea heterophylla	-	-	+	-	-	-	F	-
Circ.	Plagiomnium affine	-	-	+	-	-	-	F	-
Circ.	Riccia cavernosa	+	-	-	-	R	-	-	-
Bor.	Scorpidium scorpioides	-	-	+	-	-	-	R	-
Circ.	Sphagnum fimbriatum	-	-	+	-	-	-	R	-
Circ.	Sphagnum recurvum	-	-	+	-	-	-	R	-
Circ.	Sphagnum squarrosum	-	-	+	-	-	-	A	-
Bor.	Thuidium lanatum	-	-	+	-	-	-	F	-
	Pteridophyta								
Circ.	Equisetum arvense	+	-	-	-	F	-	-	-
Cosm.	Equisetum ramosissimum	+	-	-	+	F	-	-	R
Circ.	Lastrea thelypteris	+	-	+	-	A	-	A	-
	Angiospermae - Dicotyledones								
Pan.subend.	Achillea asplenifolia	+	-	-	-	R	-	-	-
Cosm.	Achillea millefolium	+	-	-	-	R	-	-	-
Adv.	Amaranthus retroflexus	-	-	-	+	-	-	-	F
Cosm.	Ambrosia elatior	-	-	-	+	-	-	-	R
Eua.	Angelica silvestris	+	-	-	-	F	-	-	-
Circ.	Artemisia vulgaris	-	-	-	+	-	-	-	F
Adv.	Aster tradescantii	+	-	-	-	R	-	-	-
Circ.	Batrachium trichophyllum	-	+	-	-	-	A	-	-
Eua(-med)	Bidens tripartitus	+	-	-	-	R	-	-	-
Circ.	Caltha palustris	+	-	-	-	R	-	-	-
Cosm.	Calystegia sepium	+	-	+	-	F	-	R	-
Cont.	Cannabis sativa ssp. spontanea	-	-	-	+	-	-	-	R
Adv.	Cenchrus pauciflorus	-	-	-	+	-	-	-	R
Eu.	Centaurea pannonica	+	-	-	-	F	-	-	-
Eua(-med)	Certophyllum submersum	-	+	-	-	-	A	-	-
Eua(-med)	Cirsium arvense	-	-	-	+	-	-	-	F
Cont.	Cirsium canum	+	-	-	-	F	-	-	-
Cosm.	Convolvulus arvensis	-	-	-	+	-	-	-	R
Eu.	Crepis biennis	+	-	-	-	R	-	-	-

(Table 3.cont.)

Flora elements	Species	Locality				Estimated frequency record			
		1	2	3	4	1	2	3	4
Cosm.	Daucus carota	+	-	-	-	R	-	-	-
Eua(-med)	Epilobium hirsutum	+	-	-	-	A	-	-	-
Eua.	Epilobium parviflorum	+	-	+	-	R	-	R	-
Eua(-med)	Epilobium tetragonum	+	-	-	-	R	-	-	-
Cosm.	Erigeron canadensis	-	-	-	+	-	-	-	F
Eua(-med)	Eupatorum cannabinum	+	-	+	-	A	-	R	-
Eu.	Euphorbia pseudo-esula	+	-	-	-	R	-	-	-
Circ.	Galium aparine	+	-	-	-	R	-	-	-
Circ.	Galium palustre	+	-	+	-	R	-	R	-
Circ.	Galium mollugo ssp. elatum	+	-	-	-	R	-	-	-
Eua.	Glechoma hederacea	+	-	-	-	F	-	-	-
Cosm.	Hibiscus trionum	-	-	-	+	-	-	-	R
Eua.	Knautia arvensis	+	-	-	-	R	-	-	-
Eua(-med)	Lathyrus pratensis	+	-	-	-	R	-	-	-
Eua(-med)	Lathyrus tuberosus	+	-	-	-	R	-	-	-
Eua(-med)	Lycopus europaeus	+	-	+	-	R	-	R	-
Eu(-med)	Lysimachia numularia	+	-	-	-	F	-	-	-
Eua(-med)	Lysimachia vulgaris	+	-	+	-	F	-	R	-
Circ.	Lythrum salicaria	+	-	+	-	F	-	R	-
Eua(-med)	Medicago lupulina	+	-	-	-	R	-	-	R
Eua(-med)	Melandrium album	-	-	-	+	-	-	-	R
Eu(-med)	Mentha aquatica	+	-	-	-	F	-	-	-
Eua(-med)	Myosotis palustris	+	-	-	-	R	-	-	-
Eua(-med)	Myosoton aquaticum	+	-	-	-	R	-	-	-
Eua(-med)	Oenanthe aquatica	-	+	-	-	-	R	-	-
Eu.	Oenothera biennis	+	-	-	+	R	-	-	R
Eua.	Pastinaca sativa ssp. pratensia	+	-	-	+	R	-	-	R
Cosm.	Plantago major	+	-	-	+	R	-	-	R
Circ.	Polygonum amphium f. aquaticum	-	+	-	-	-	R	-	-
Circ.	Polygonum amphibium f. terrestre	+	-	-	-	R	-	-	-
Eua(-med)	Polygonum convolvulus	+	-	+	-	R	-	-	-
Eua(-med)	Polygonum patulum	-	-	-	+	-	-	-	R
Eua.	Populus alba	+	-	-	-	F	-	-	-
Eua.	Populus nigra ssp. pyramidale	+	-	-	-	R	-	-	-
Eua(-med)	Populus tremula	+	-	+	-	F	-	F	-
Cosm.	Potentilla reptans	+	-	-	-	R	-	-	-
Circ.	Prunella vulgaris	+	-	-	-	R	-	-	-
Circ.	Ranunculus sceleratus	+	-	-	-	R	-	-	-
Eua(-med)	Rorippa amphibia	-	+	-	-	-	A	-	-
Eua(-med)	Rubus caesius	+	-	-	-	A	-	-	-
Cent.Eu.	Rumex hydrolapathum	+	-	-	-	R	-	-	-
Eua(-med)	Salix cinerea	+	-	+	-	A	-	A	-
Eua.	Salix triandra	+	-	+	-	A	-	A	-
Eua(-med)	Salsola kali	-	-	-	+	-	-	-	R
Eu(-med)	Sambucus nigra	+	-	-	-	R	-	-	-
Circ.	Scutellaria galericulata	+	-	+	-	R	-	R	-
Eua(-med)	Silene vulgaris	+	-	-	-	R	-	-	-
Eua(-med)	Solanum dulcamara	+	-	+	-	F	-	R	-
adv.	Solidago gigantea	+	-	-	-	R	-	-	-
Cosm.	Sonchus arvensis	+	-	-	+	R	-	-	R
Eu	Symphytum officinale	+	-	-	-	F	-	-	-
Eua(-med)	Teucrium scordium	+	-	+	-	F	-	R	-

(Table 3. cont.)

Flora elements	Species	Locality				Estimated frequency record			
		1	2	3	4	1	2	3	4
Cent.Eu.	Trifolium hybridum	+	-	-	-	R	-	-	-
Eua(-med)	Trifolium pratense	+	-	-	-	R	-	-	-
Cosm.	Trifolium repens	+	-	-	-	F	-	-	-
Cosm.	Urtica dioica	+	-	-	-	F	-	-	-
Circ.	Utricularia vulgaris	-	+	-	-	-	F	-	-
Circ.	Vicia cracca	+	-	-	-	R	-	-	-
	Angiospermae - Monocotyledones								
Circ.	Agropyron repens	-	-	-	+	-	-	-	R
Circ.	Agrostis alba	+	-	-	-	R	-	-	-
Eu.	Alisma lanceolatum	+	-	-	-	R	-	-	-
Circ.	Alisma plantago-aquatica	+	-	-	-	R	-	-	-
Eua.	Alopecurus pratensis	+	-	-	-	R	-	-	-
Eu.	Arrhenatherum elatius	+	-	-	-	R	-	-	-
Eu.	Briza media	+	-	-	-	R	-	-	-
Eua(-med)	Calamagrostis epigeios	+	-	+	-	R	-	R	-
Eua(-med)	Carex acutiformis	+	-	+	-	F	-	R	-
Cent-Eu.	Carex elata	+	-	-	-	A	-	-	-
Eua-sib.	Carex gracilis	+	-	-	-	A	-	-	-
Cent-Eu.	Carex paniculata	-	-	+	-	-	-	F	-
Eu(-med)	Carex hirta	+	-	-	-	F	-	-	-
Circ.	Carex pseudocyperus	+	-	+	-	A	-	R	-
Eua(-med)	Carex riparia	+	-	-	-	A	-	-	-
Cosm.	Cynodon dactylon	-	-	-	+	-	-	-	R
Euras.	Dactylis glomerata	+	-	-	-	R	-	-	-
Eua-sib.	Epipactis palustris	+	-	+	-	R	-	F	-
Eua.	Festuca pratensis	+	-	-	-	R	-	-	-
Eu(-med)	Holcus lanatus	+	-	-	-	R	-	-	-
Circ.	Juncus articulatus	+	-	-	-	R	-	-	-
Eua-sib.	Juncus compressus	+	-	-	-	R	-	-	-
Cosm.	Lemna minor	-	+	+	-	-	F	F	-
Cosm.	Lemna trisulca	-	+	-	-	-	F	-	-
Eu.	Molinia coerulea	+	-	-	-	F	-	-	-
Cosm.	Phragmites communis	+	+	+	-	A	R	A	-
Circ.	Poa trivialis	+	-	-	-	R	-	-	-
Circ.	Potamogeton natans	-	+	-	-	-	F	-	-
Eua.	Setaria viridis	-	-	+	-	-	-	R	

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Author's address: E. STOLLMAYER-BONCZ
Szerb Antal Gimnázium
Budapest, Kulturház u. 12.
H-1164
HUNGARY