

The aquatic and paludal flora and vegetation from the Criş/Körös¹ Valleys

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Abstract

This study presents the aquatic and paludal flora and vegetation of the Criş Valleys. After a brief presentation of the history of botanical research on this area we give a list with the 390 species and another one with the 92 associations which are characteristic for the wet ecosystems of these rivers. The list of species also includes the IUCN "Red list".

Keywords: Aquatic, paludal, flora, vegetation, association, Criş rivers

Introduction

This study presents the aquatic and paludal flora and vegetation of the Crişul Alb/Fehér-Körös, Crişul Negru/Fekete-Körös and Crişul Repede/Sebes-Körös (which flow mostly on the Romanian territory) and of the Kettős-Körös and Hármas-Körös (on the Hungarian territory).

We entered this study aiming to complete the botanical information of the not yet researched or very little investigated sectors of the Criş, and aiming to offer a synthetic, general image of the flora and vegetation of the wet (humid) ecosystems of these rivers.

The floristic-phytocenological research in the Criş Valleys began in the second half of the 19th century, when A. Kerner (1867-1879) mentioned some species of plants from the Bihor Mts., at springs of the Crişul Negru and Crişul Repede. L. Simonkai presented more plants on the middle and inferior water-way of the Crişul Repede (1879, 1890) and of the Crişul Alb (1893), and V. Borbás (1891) gave floristic data from the Crişul Repede's inferior water-way, from the Kettős-Körös and Hármas-Körös. In the first half of the 20th century the botanical information completed the floristic data from the Lower Plain of the Criş (K. Flatt, 1901, P. H. Franzé, 1904, R. Soó, I. Máthé, 1938, R. Soó, 1938, 1946, 1947). At the same time the specific character of the flora from the springs of the Crişul Repede, Crişul Negru and Crişul Alb was pointed out (A. Paucă, 1935, 1940, 1941, Al. Borza and V. Borza, 1939,

1 The first name is Romanian, and the second Hungarian.

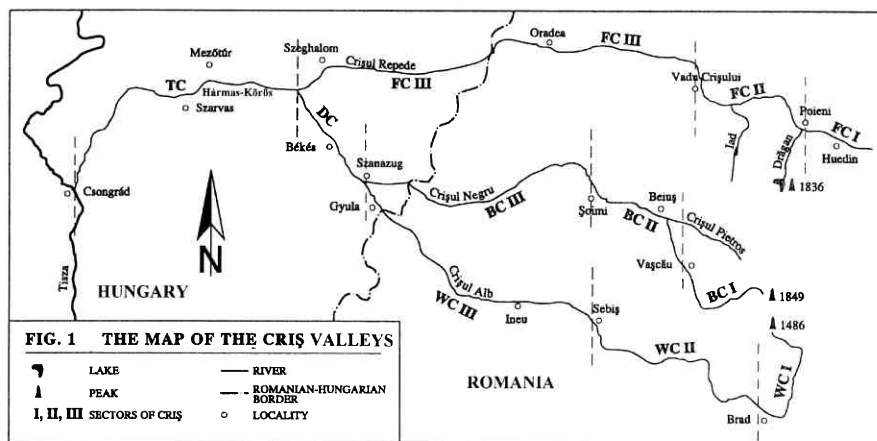
E. Pop, 1940, 1947). In the second half of this century, the Criș's flora and vegetation were studied by L. Timár (1952) and L. Timár and Gy. Bodrogekőzi (1959) who published data from the Hungarian sector of the Criș, by O. Rațiu (1964, 1965, 1966, 1973), O. Rațiu et Gh. Sălăgeanu (1971), O. Rațiu et I. Gergely (1976, 1985), O. Rațiu et al. (1982, 1983, 1984), N. Boșcaiu et al. (1966), A. Nyárády et al. (1966), Șt. Csűrös et al. (1967, 1969) and I. Resmeriță (1970) who configured an almost complete image of the vegetal carpet from the superior water-way of the Crișul Repede. I. Pop (1968, 1972), together with I. Hodișan (1969, 1972, 1973), or with the group (1978), studied in detail the area between the Crișul Negru and the Crișul Repede, and gave floristic-phytocenological data from the Crișul Alb. This last river was well researched by A. Ardelean (1980, 1982, 1984), especially in its mountainous and hilly sector.

Until the beginning of our scientific investigations, the situation of the botanical research of the Criș was as follows: the flora was relatively well known on the Crișul Repede and the Crișul Alb and on the superior water-way of the Crișul Negru; the vegetation was studied only on the superior water-way of the Crișul Repede and the Crișul Alb, with very poor information existing from other sectors of the Criș, and missing the phytocenological data from the Crișul Negru (except for the mountainous water-way of the river). Through this study we succeeded in establishing a thorough knowledge of the flora and vegetation of the Criș rivers, and a databasae for its botanical characterization and for comparative studies between flora and the vegetation of all these rivers (named Criș).

Materials and methods

The Criș Valleys take up a very large surface area, with a very different relief, geological and pedological structure and with a varied climate. Taking into account these variations, for a better characterization of the Criș we divided the river into sectors as follows: the mountainous sectors of the Crișul Alb, Crișul Negru and Crișul Repede (noted with WC-I, BC-I and FC-I), the hilly sectors (noted with WC-II, BC-II and FC-II), the plain sectors (noted with WC-III, BC-III and FC-III), the common sectors of the Crișul Alb and the Crișul Negru, named Kettős-Körös (noted DC) and the common sectors of the Kettős-Körös and the Crișul Repede, named the Hármas-Körös (noted TC) (Fig. 1).

This work was carried out by relying on our own on the spot research and by consulting the specialised bibliography and some herbaria. All useful information was recorded on species and vegetal associations index cards which included nomenclatural and chorological data. In addition; the species index cards included specifications regarding the bioform, the ecological preferences and the floristic element. The biological, ecological and phytogeographical characterization was made according to V. Sanda et al. (1983) and R. Soó (1964, 1980). The nomenclature of the species and vegetal associations was presented according to the "Romania's Flora"



(1952-1976), V. Sanda et al. (1980, 1983) and R. Soó (1964-1980). In this study we point out and analyse only the aquatic and paludal (marshy) flora and vegetation of the Criș, and the respective vegetal elements which directly come into contact with the water, the banks and the river-meadows of the Criș. All new, unpublished data are followed by an exclamation point (!). In the enumeration of the species we used the following abbreviations of the names of the bioforms and floristic elements: Hh - helohydathophyte, H - hemicryptophyte, Th - annual therophyte, TH - biannual therophyte, G - geophyte, MPh - megaphanerophyte, mPh - mesophanerophyte, nPh - nanophanerophyte, Ch - chamaephyte; Eua - Eurasian, E - European, Ec - Central-European, Cp - circumpolar, Bor - boreal, Cosm - cosmopolitan, Adv - adventive, M - Mediterranean, Atl-M - Atlantic-Mediterranean, C - continental, Pn - Pannonic, P - Pontic, D - Dacic, Carp - Carpathic, End - Endemic, B - Balcanic, Sarm - Sarmatic, Cauc - Caucasian, Alp - Alpin.

Results and Discussion

By synthesizing the information concerning the flora and vegetation of the Criș (information collected from the bibliography and the results of our own research), we consider that in the whole area of the Criș there are 1860 species of cormophytes grouped in 167 vegetal associations. From this total, 380 species are hydrophilous, hygrophilous and hygro-mesophilous plants and 92 associations group aquatic and paludal phytocenoses, including lawns and weeds of more or less humid ecotops, distributed as follows (Tab. 1.):

Tab. 1. The distribution of the macrophyte species and associations in the Criş Valleys

River	Nr. of cormophytes	Nr. of associations	Nr. of aq.+pal. Sp.	Nr. of aq.+pal. Ass.	Nr. of new aq.+pal. Sp.	Nr. of new aq.+pal. Ass.
Crişul Alb	1250	98	260	51	20	25
Crişul Negru	1192	107	216	50	54	41
Crişul Repede	1365	130	337	62	6	8
Kettős-Körös	590	50	108	15	18	13
Hármas-Körös	650	62	119	21	7	11
Total	1860	167	390	92	11	22

From the 380 species 46 are aquatic, floating or submersed and from the 92 vegetal associations 16 are strictly aquatic. From the aquatic species known on the Criş, 29 were also found by us. These are *Salvinia natans*, *Polygonum amphibium*, *Nymphaea lotus* var. *thermalis*, *Nuphar lutea*, *Ceratophyllum demersum*, *Ranunculus trichophyllus*, *R. circinatus*, *Trapa natans*, *Myriophyllum spicatum*; *M. verticillatum*, *Callitriche cophocarpa*, *C. palustris*, *Utricularia vulgaris*, *Sagittaria sagittifolia*, *Butomus umbellatus*, *Hydrocharis morsus-ranae*, *Vallisneria spiralis*, *Potamogeton crispus*, *P. natans*, *P. nodosus*, *P. pusillus*, *P. trichoides*, *Zannichellia palustris*, *Najas marina*, *N. minor*, *Lemna gibba*, *L. minor*, *L. trisulca*, *Spirodela polyrrhiza*. Some of these species grow in a relatively great number, constituting characteristic phytocenoses in the water of the rivers, especially towards their banks, where a series of aquatic animals find their shelter and food. Such phytocenoses, more or less distinguished, are constituted from *Salvinia natans* (in the Criş Channel, at Tinca, Chişinău-Criş, Békés, Vărşand, in a channel at Békésszentandrás), *Polygonum amphibium* (at Aciuţa, Criş, Bocsig, Tinca, Gyula), *Nymphaea lotus* var. *thermalis* (at Oradea), *Ceratophyllum demersum* (at Bocsig, Vărşand, Tinca, in the Criş Channel, Gyula, Szeghalom, Cheresig, Fughiu, Békés, Csongrád), *Trapa natans* (in the Criş Channel and near Békés), *Myriophyllum spicatum* (at Ineu, Bocsig, Beiuş, Borz, Tinca, Gyula, Aleşd, Tileagd, Szeghalom), *Hydrocharis morsus-ranae* (in the Criş Channel and in a channel at Békésszentandrás), *Potamogeton crispus* (at Zerind, Gyula and Csongrád), *Potamogeton natans* (at Beiuş and Borz), *Potamogeton nodosus* (in the Criş Channel, at Tinca, near Békés, Vărşand, Gyula, Cheresig, Szeghalom, Csongrád), *Potamogeton pusillus* (in the defile of the Crişul Repede), *Potamogeton trichoides* (at Cheresig), *Najas marina* (at Tinca, Avram Iancu, the Criş Channel, Zerind, Gyula, near Békés, Szeghalom, Csongrád), *Najas minor* (at Tinca, Gyula, the Criş Channel, near Békés, Fughiu, Csongrád), *Lemna gibba* (at Csongrád), *Lemna minor* (in the Criş Channel, Mihăileni, Vărşand, Gyula, Békés, the defile of the Crişul Repede, Oradea, Szeghalom), *Lemna trisulca* (in the Criş Channel), *Spirodela polyrrhiza* (at Vărşand, Gyula, the Criş Channel, the channel at Békésszentandrás, near Békés, Csongrád, Szeghalom).

The aquatic vegetal associations constituted mostly from these plants were noticed and studied on the Crișul Alb at Hălmagiu, Ociu and Ocișor (Polygonetum natantis), Mesteacăn, Vața, Brad (Lemnetum minoris), Vârșand (Lemnetum minoris, Salvinio-Spirodeletum), Bocsig (Potametum natantis, Potameto-Ceratophylletum, Myriophyllo-Potametum), Ineu (Potameto-Ceratophylletum, Myriophyllo-Potametum); on the Crișul Negru at Borz (Myriophyllo-Potametum), Finiș (Potametum natantis), Tinca (Myriophyllo-Potametum, Najadeto-Ceratophylletum, Polygonetum natantis), Batăr (Lemnetum minoris, Polygonetum natantis), the Criș Channel (Lemnetum minoris, Salvinio-Spirodeletum, Lemno-Utricularietum, Ceratophylleto-Hydrocharetum, Trapetum natantis), Avram Iancu (Lemnetum minoris, Ceratophylleto-Hydrocharetum), Zerind (Potametum crispum), Gyula (Lemnetum minoris, Salvinio-Spirodeletum, Potameto-Ceratophylletum, Potametum nodosum, Najadeto-Ceratophylletum, Polygonetum natantis); on the Crișul Repede at Izvorul Crișului (Lemno-Utricularietum, Ranunculo trichophylli-Callitrichetum), on the Drăgan Valley (Callitrichetum cophocarpae-palustris), in the Criș Defile (Callitrichetum cophocarpae-palustris, Potametum crispum, Potametum natantis) at Oradea (Lemnetum minoris, Nymphaetum loti-thermalis), at Szeghalom (Potameto-Ceratophylletum); on the Kettős-Körös near Békés (Potametum nodosum, Najadeto-Ceratophylletum, Salvinio-Spirodeletum, Potameto-Ceratophylletum, Trapetum natantis) and on the Hármas-Körös on the channel at Békésszentandrás (Ceratophylleto-Hydrocharetum, Salvinio-Spirodeletum, Potametum nodosum, Potameto-Ceratophylletum) and at Csongrád (Lemnetum minoris, Lemno-Utricularietum, Potametum nodosum, Najadeto-Ceratophylletum).

In the following, we present one conspectus (index) with aquatic and paludal species of plants and another one with aquatic and paludal vegetal associations from the Criș Valleys, specifying by each species and association the river sector where it was identified.

The hydrophilous and hygrophilous flora

EQUISETACEAE

1. Equisetum hyemale L.: FC-I (11, 55, 57); G, Cp (bor); Alno-Padion; rC
2. E. fluviatile L. (E. limosum L.): WC-I-II (1, !), FC-I (11, 37, 55), FC-III (70); C f. ramigerum A. Br.: FC-III (60); Hh, Cp (bor); Magnocaricion, Phragmitetia
3. E. palustre L.: WC-I (1, !), BC-I-II (34, 35, 40, 41, !), FC-I (11, 55), FC-II (16, !); C f. corymbosum Milde: FC-III (!); G, Cp (bor); Molinietalia
4. E. sylvaticum L.: WC-II (44), FC-I (55, 57); G, Cp (bor); Alno-Padion; C
5. E. telmateia Ehrh. (E. maximum Lam.): WC-I-II (1, !), BC-I-II (35, 40, !); G, Cp (bor); Alno-Padion, Filipendulo-Petition; C
6. E. x moorei Newm. (hyemale x ramosissimum): FC-I (11)

OPHIOGLOSSACEAE

7. *Ophioglossum vulgatum* L.: FC-I (11, 23, 55); G, Cp (bor); Molinion; Ex?

ATHYRIACEAE

8. *Matteuccia stuthiopteris* (L.) Todaro: WC-II (44), BC-I (!), FC-I (11, 23, 55, 57), FC-III (23); H, Cp (bor); Alno-Padion; rC

9. *Athyrium filix-femina* (L.) Roth: WC-I (23), BC-I (23, !), FC-I (11, 23, 55); var. *multidentatum* (Döll) Milde: FC-I (23); H, Cosm; *Adenostyletalia*, Alno-Padion; C

THELYPTERIDACEAE

10. *Thelypteris palustris* Schott (*Dryopteris thelypteris* (L.) A. Gray): BC-II (34, 35), FC-I (50, 55), FC-III (23); Hh, Cp (bor); Alno-Padion, *Magnocaricion*; rC

ASPIDIACEAE

11. *Dryopteris carthusiana* (Vill.) H. P. Fuchs: WC-II (44), BC-I (23), FC-I (55); H, Cp (bor); Alno-Padion, *Magnocaricion*; R

12. *D. filix-mas* (L.) Schott: WC-I (23), WC-II (44), BC-I (23, 36, !), FC-I (55), FC-III (23, !); H, Cosm; *Fagetalia*; C

MARSILIACEAE

13. *Marsilia quadrifolia* L.: WC-III (1, 23, 70, 44), BC-III (23, 61, 67), FC-III (23, 60, 67), DC (14), TC (14, 72); Hh, Eua (M); *Nanocyperion*; Ex?

SALVINIACEAE

14. *Salvinia natans* (L.) All.: WC-III (1, 23, 67, 70, !), BC-III (23, !), FC-III (60), DC (!), TC (14, 70, !); Hh, Eua; *Hydrocharition*; rC

SALICACEAE

15. *Populus alba* L.: WC-II-III (1, 23, 43, !), BC-II-III (23, !), FC-I (11), FC-III (23, !), TC (!); MPh, Eua; *Salicacetalia purpureae*; C

16. *P. nigra* L.: WC-II-III (1, 23, 43, 44, !), BC-II (23), FC-I (11), FC-III (23), DC, TC (!); MPh, Eua; *Salicetalia purpureae*; C

17. *P. x canescens* Sm. (*alba x tremula*): FC-III (60, 70), TC (70, 73)

18. *Salix alba* L.: WC-I-II-III (1, 43, 44, !), BC-I-II-III (!), FC-I-II-III (11, 16, 55, 60, !), DC (!), TC (73, !); C

f. *angustata* Anders.: FC-I (11); MPh, Eua; *Salicion albae*, Alno-Padion

19. *S. aurita* L.: FC-I (23, 37, 55); E

f. *rhomboidalis*: FC-I (37); mPh, E; Alnion, *Caricetalia nigrae*

20. *S. cinerea* L.: WC-II (44, !), BC-I (39), BC-II (35), FC-I (11, 55, 57), DC (70), TC (70); mPh, Eua; Alnetea, Alno-Padion; C

21. *S. fragilis* L.: WC-I-II-III (1, !), BC-I-II-III (34, !), FC-I (11, 37, 55), FC-II-III (16, 60, !), DC (!), TC (70, 73, !); C

f. *latifolia* Anders.: FC-I (37); mPh-MPh, Eua; *Salicion albae*, *Salicion triandrae*, Alno-Padion

22. *S. pentandra* L.: FC-I (37); MPh, Eua; Alnetea; C

23. *S. purpurea* L.: WC-I-II (!), BC-I-II (35, 40, !), FC-I-II (11, 16, 55); C

f. *angustifolia* Kern.: WC-I (1); mPh, Eua; *Salicetalia purpureae*

24. *S. rosmarinifolia* L.: FC-I (37); mPh, Eua; Molinion; E

25. *S. silesiaca* Willd.: WC-I (1), FC-I (54, 55, 56); mPh, B-Carp-Sudet; Pinion mugi; rC

26. *S. triandra* L.: WC-III (1, 43, !), BC-II-III (!), FC-I (11, 55, !), FC-III (!), DC (70, !), TC (73, !); C

ssp. *amygdalina* L.: DC (70); MPh, Eua; *Salicion triandrae*

27. *S. viminalis* L.: WC-III, BC-III (!), DC (70, !), TC (70); mPh, Eua; *Salicetalia*; C

28. *S. x alopecuroides* Tausch (triandra x fragilis): FC-III (60);
 f. hypoleuca: TC (70)
 29. *S. x capreola* Kern. (aurita x caprea): FC-I (23, 37)
 30. *S. x multinervis* Döll (aurita x cinerea): FC-I (23, 37)
 31. *S. x rubens* Schrank. (alba x fragilis): BC-II (34, !), FC-I (55);
 var. excelsior (Host.) A. et G.: FC-III (60), TC (70)
 32. *S. x subaurita* Anderss. (aurita x silesiaca): FC-I (23, 37)
 33. *S. x undulata* Ehrh. (alba x triandra): WC-II-III (1, 23, 70, 44), DC, TC (70)

BETULACEAE

34. *Alnus glutinosa* (L.) Gartn.: WC-I-II (1, 44, !), WC-III (43), BC-I-II (35, !), FC-I-II FC-I-II (11, 16, 55, !); MPh, Eua; Alnion glutinosae, Alno-Padion; C
 35. *A. incana* (L.) Mnch.: WC-I-II (1, 44, !), BC-I (!), FC-I (11, 37, 55, !), FC-III (23); C
 f. glabrescens Simk.: FC-III (23); MPh, Eua; Alno-Padion, Salicion albae
 36. *A. x pubescens* Tausch (glutinosa x incana): FC-I (60);
 f. badensis (Lang.) Call.: FC-I (23);
 f. subglutinosa Simk.: FC-I (55);
 f. subincana Simk.: FC-I (23, 60)
 37. *Betula pubescens* Ehrh.: FC-I (23, 37, 38); mPh, Eua; Alnetea, Vaccinio-Piceion;
 f. glabra Fieck.: FC-I (37); Ex?-E
 f. ovalis: FC-I (37);
 f. rhomboidalis: FC-I (37)
 38. *B. x hybrida* Bechst. (pendula x pubescens): FC-I (37)

ULMACEAE

39. *Ulmus laevis* Pallas: WC-III (1, 23), BC-II-III (23), FC-III (23, 42); MPh-mPh, E; Alno-Padion; rC

URTICACEAE

40. *Parietaria officinalis* L.: WC-I-II (1, 44), BC-I (35, 40, !); FC-I (11, 55, !); H, M; Alno-Padion; C

POLYGONACEAE

41. *Polygonum amphibium* L.: WC-I-II (!), WC-III (70, !), BC-III (!), FC-I (11, 55, 57), FC-III (14, !), DC (14, 70, !), TC (14, 73); C
 f. terestre (Leyss.) I. Grinț.: BC-III (!), FC-I (11, 57), FC-III (23, 70), DC (70, !); C
 f. aquaticum (Leyss.) I. Grinț.: FC-I (11, !), FC-III (23, 70), DC (70), TC (8); G-Hh, Cosm; Phragmitetea, Salicetea, Polygono-Chenopodion; rC
 42. *P. bistorta* L.: FC-I (55); H, Eua; Molinietalia; I
 43. *P. cuspidatum* Sieb. et Zucc.: WC-II, BC-III (!); H, Adv; Calystegion; C
 44. *P. hydropiper* L.: WC-I-II-III (1, !), BC-I-II-III (!), FC-I (55, 57), FC-III (23, 70), DC (14, 70), TC (70); C
 f. hungaricum: FC-III, DC (70); Th, Eua (M); Populetalia, Alnetea, Bidention
 45. *P. lapathifolium* L.: WC-II-III (!), BC-II-III (35, !), FC-I (55, 57, !), FC-III (23, 70), DC, TC (14, 70, !); C
 var. tomentosum (Schrank) Beck: WC-I-II-III (1), BC-III, TC (70)Th; Cosm; Polygono-Chenopodion, Bidentetalia
 46. *P. minus* Huds.: WC-I-II (1, 23, 44), FC-I (10), FC-III (23, 70), DC (70), TC (14); Th, Eua; Bidention; C
 47. *P. mite* Schrank: WC-I-II (1), BC-II (35, !), FC-III (23); Th, Eua; Bidentetalia; C

48. *P. persicaria* L.: WC-I-II-III (!), BC-II-III (35, !), FC-I (10, 11, 55), FC-III (23), DC, TC (14); Th, Eua; Populetalia, Phragmitetia; C
49. *Rumex aquaticus* L.: WC-III (1), FC-III (23); Hh, Cp (bor); Filipendulo-Petasition; rC
50. *R. conglomeratus* Murr.: WC-I-II-III (1, 23, !), BC-II-III (23, !), FC-I (10, 55), FC-III (23, !), DC (70, !), TC (70); H, Cp; Bidention, Agropyro-Rumicion; C
51. *R. crispus* L.: WC-II-III (1, !), BC-II-III (35, !), FC-I (11, 55), FC-II-III (!), DC (!); H, Eua; Agropyro-Rumicion; C
52. *R. hydrolapathum* Huds.: FC-III (23, 70), DC, TC (70); H (G), E; Phragmition; rC
53. *R. maritimus* L.: FC-III (23), DC (70); Th, Eua; Bidention; rC
54. *R. obtusifolius* L.: WC-II (44, !), BC-I-II (40, !), FC-I (55), FC-III (23); rC
ssp. *silvestris* (Lam.) Rech: BC-II (33), FC-III (23, 70), DC (70);
ssp. *transiens* (Simk.) Rech: FC-III (23, 70);
ssp. *subalpinus* (Schur) Simk.: WC-II (23); H, E; Epilobietalia, Arction
55. *R. palustris* Sm. (*R. limosus* Thuill.): WC-III (1), FC-III (14, 23), DC (8, 14); Th-TH, Eua; Phragmitetia-Bidentetia; rC
56. *R. pulcher* L.: WC-III (23, 70), BC-II (33, 35), FC-III (23); Th-TH, Atl-M; Chenopodietalia; rC
57. *R. sanguineus* L.: WC-I-II-III (1, 23, 43, 44, !), FC-I (10), FC-III (23), DC (70); H, E; Alno-Padion; C
58. *R. stenophyllus* Ldb.: WC-III, FC-III (23), TC (14); H, Eua (C); Beckmannion, Bidentetia; I
59. *R. x acutus* L. (*crispus x obtusifolius*): FC-III (23)
60. *R. x confinis* Hausskn. (*crispus x obtusifolius* ssp. *silvestris*): FC-III (70)
61. *R. x dufftii* Hausskn. (*obtusifolius x sanguineus*): FC-III (23)
62. *R. x palustris* Simk. (*palustris x obtusifolius* ssp. *silvestris*): FC-III (23, 60)

CHENOPODIACEAE

63. *Suaeda maritima* (L.) Dumort: WC-III (23); I
var. *filiformis* (Dumort) Graebn.: WC-III (23); Th, Cosm

PORTULACACEAE

64. *Montia fontana* L.: (*M. verna* Necker): BC-I-II (23, 41, Herb. Pop), FC-III (23); Th, Cp (bor); Nanocyperion, Cardamino-Montion; E

CARYOPHYLLACEAE

65. *Cucubalus baccifer* L.: WC-II (44, !), WC-III (70), BC-II (33, !), FC-I (11, 57), FC-III (70), DC (70); H, Eua; Senecion fluviatilis, Calystegion; C
66. *Lychnis flos-cuculi* L.: WC-I-II-III (1, 70, 44, !), BC-I-II (28, 35, 40, 41, !), FC-I-II-III (11, 16, 30, 27, 50, 55, !); H, Eua; Molinietalia, Magnocaricion; C
67. *Moehringia muscosa* L.: WC-I (1), WC-II (44), FC-I (10, 55); H, Euc; Moehringion muscosae; K
68. *Myosoton aquaticum* (L.) Mnch. (*Stellaria aquatica* (L.) Scop.): WC-II-III (1, 23, 44), BC-I-II (35, 40, !), FC-I (11, 37, 55), FC-III (23); Th-TH, Eua (M); Alno-Padion, Senecion fluviatilis; rC
69. *Saponaria officinalis* L.: WC-II-III (1, 23, 70, !), BC-II-III (33, !), FC-I (11, 57), TC (70); C f. *glaberrima* Ser.: FC-I (57); H, Eua (M); Senecion fluviatilis, Calystegion
70. *Spergularia rubra* (L.) J. et C. Presl.: WC-III (1), FC-I (11), DC, TC (70); Th-H, Cp (bor); Nanocyperion, Bidentetia; rC
71. *Stellaria alsine* Grimm.: FC-I (37, 50, 52, 54, 55); H Cp (bor); Cardamino-Montion; rC
72. *S. palustris* Retz.: FC-I (57); H, Eua; Caricetalia nigrae, Alnetea; E

NYMPHAEACEAE

73. *Nymphaea alba* L.: TC (70, 73); Hh, E (M); Nymphaeion; V
74. *N. lotus* L.:
var. *thermalis* (DC.) Tusz.: FC-III (23, 31); Hh, Trop; Nymphaeion; E
75. *Nuphar lutea* (L.) Sibth. et Sm.: WC-III (70), BC-III (70, !), FC-III (70); Hh, Eua (M); Nymphaeion; R

CERATOPHYLLACEAE

76. *Ceratophyllum demersum* L.: WC-II-III (1, 23, 70, !), BC-II-III (34, 39, !), FC-III (31, 60, 70, !), DC (!), TC (70, !); Hh, Cosm; Potametea; rC
77. *C. submersum* L.: BC-II (34), BC-III (14), FC-III (23, 60), DC (14); Hh, Eua (M); Hydrocharition, Potamion; R

RANUNCULACEAE

78. *Caltha palustris* L.
ssp. *laeta* S., N. et Ky: WC-I (!), BC-I-II (35, 41, !), FC-I (11, 49, 52, 55, !), FC-II (16); C
var. *pseudocornuta* Zap.: FC-III (23);
var. *alpina* (Schur) Graebn.: WC-I (1); H, E; Calthion, Alno-Padion, Magnocaricetalia
79. *Myosurus minimus* L.: WC-III (1, 23), BC-III, FC-III (23); Th, Cp; Nanocyperion; V
80. *Ranunculus aquatilis* L.: WC-II-III (1, 70, 44), BC-III (8, 70), FC-I (11, !), FC-III (23, 60, 70), DC, TC (70); rC
f. *succulentus*: WC-III (70);
f. *peltatus*: DC, TC (70);
f. *crenatus*: WC-III, FC-III (70);
f. *dissectus*: WC-III, FC-III (70); Hh, Cosm; Potamion, Nymphaeion
81. *R. flammula* L.: WC-II (1, 61), BC-II-III (35, !), FC-I (23, 11, 55); rC
f. *pilifer* (Beck) Borza: BC-II (35), FC-III (23);
f. *tenuifolius* Wallr.: FC-I (55), FC-III (23); H, Eua; Magnocaricion, Caricion canescenti-nigrae
82. *R. lateriflorus* DC.: WC-III (23,), FC-III (23, 60), TC (14, 73); Th, Eua (C); Beckmannion, Nanocyperion; V
83. *R. peltatus* Schrank: BC-I (23), FC-III (23, 60); WC-III (9, 70), TC (70); Hh, E; Potamion; V
84. *R. repens* L.: WC-I-II-III (1, 43, !), BC-I-II-III (35, !), FC-I-II-III (11, 16, 49, 55, !), DC (!); H, Eua (M); Alno-Padion, Agopyro-Rumicion, Calystegion; C
85. *R. sceleratus* L.: BC-II (!), FC-I (11, 55), FC-III (23), TC (14); Th, Cp; Bidention; C
86. *R. trichophyllus* Chaix.: WC-III (1, 23), FC-I (57, !), FC-III (23), DC (70); rC
var. *paucistramineum* Tausch: FC-II (30); Hh, E; Potamion
87. *R. circinatus* Sibth.: FC-I (!); Hh, Eua; Potamion; V
88. *Thalictrum lucidum* L.: BC-II (!), FC-I (55); rC
var. *angustifolium* (Jacq.) Nyár.
f. *angustissimum* (Cr.) Nyár.: WC-II (23);
f. *peucedanifolium* Gris. et Schenk.: BC-I-II (23), FC-III (23);
var. *stenophyllum* (Wimm. et Grab.) Hay.
f. *subglabrum* (Simk.) Nyár.: WC-III (23);
var. *heterophyllum* (Wimm. et Grab.) Hay.: BC-I-II, FC-III (23);
f. *nigricans* Scop.: FC-I (11); H, Ec; Alno-Padion, Filipendulo-Petasition
89. *Trollius europaeus* L.: FC-I (10, 50, 55); H, E; Molinietaia; R

BRASSICACEAE

90. *Cardamine amara* L.: FC-I (10, 23, 50, 52, 54, 55), FC-III (23, 60);

- var. *macrophylla* Wender: FC-I (55), FC-III (23); H, Eua (M); Cardamino-Montion, Alno-Padion; C
91. *C. flexuosa* With.: BC-I (23), FC-I (10, 11, 55), FC-III (23); Th-TH, Cp (bor); Cardamino-Montion; rC
92. *C. pratensis* L.: WC-I-II-III (1, !), BC-I (23, !), FC-I (10, 23, 49, 50, 52, 55, !), FC-II (16), FC-III (23); C
- ssp. *mathiolii* Moretti (ssp. *hayneana* (Welw.) O. E. Schultz): WC-III (70), FC-I (10, 11), FC-II (30);
- ssp. *rivularis* Schur: FC-I (10, 55); H, Cp (bor); Caricetalia *nigrae*, Molinieta
93. *Rorippa amphibia* (L.) Bess.: WC-II (1), WC-III (70), BC-III (23, !), FC-III (60, 70), DC (70, !); Hh, Eua (M); Phragmitetea, Populetalia, Alnetea; C
94. *R. austriaca* (Cr.) Bess.: WC-II (1), WC-III (!), BC-III (!), FC-I (11, 55), DC (!), TC (14); H-G, Ec; Senecion *fluviatilis*, Agropyro-Rumicion; C
95. *R. islandica* (Oed.) Borb.: WC-II-III (1, 23), FC-I (23, 55, 57, 60), FC-III (23); Th-TH, Cosm; Bidention; rC
96. *R. sylvestris* (L.) Bess.: WC-II-III (1, 44, !), BC-I-II (34, 35, !), FC-I (10, 49, 50, 55); C
- ssp. *kernerii* (Menyh) Soó: FC-III (23); H-G, E; Agropyro-Rumicion, Beckmannion
97. *R. x armoracioides* (Tsch.) Fuss (*austriaca* x *sylvestris*): WC-III (1, 23, 70, !), FC-I (53), DC (70);
- var. *terrestris* Tsch.: WC-III, TC (70);
- var. *pinnatifida* (Tsch.) Borb.: WC-III (23), FC-III (60)
98. *R. x hungarica* Borb. (*amphibia* x *austriaca*): TC (70);
- var. *riparia* (Simk.) Nyár.: FC-III (60)

DROSERACEAE

99. *Aldrovanda vesiculosa* L.: FC-III (70); Hh, Adv; Lemnion, Hydrocharition; Ex?
100. *Drosera rotundifolia* L.: BC-I (28, 61), FC-I (10, 23, 37, 38, 50, 55); H, Cp (bor); Sphagnetalia *fusci*, Caricetalia *nigrae*; Ex?

SAXIFRAGACEAE

101. *Chrysosplenium alternifolium* L.: WC-I-II (1), FC-I (10, 11, 52, 55); H, Cp (bor); Alno-Padion; rC

PARNASSIACEAE

102. *Parnassia palustris* L.: WC-I-II (1), BC-I (33, 36, 40), FC-I (10, 37, 50, 54, 55); H, Cp (bor); Tofieldetalia, Molinion; C

ROSACEAE

103. *Filipendula ulmaria* (L.) Maxim: WC-I (!), BC-I-II (35, !), FC-I-II (10, 11, 30, 49, 50, 52, 55, !); C
- f. *denudata* (J. et C. Presl.) Beck: FC-I (23, 55);
- f. *glauca* (Schulz) A. et G.: FC-I (55); H, Eua; Filipendulo-Petasition, Alno-Padion, Molinieta
104. *Geum rivale* L.: BC-I (40), FC-I (10, 23, 49, 50, 52, 55); H, Cp (bor); Calthion, Filipendulo-Petasition, Adenostylum; C
105. *Potentilla anserina* L.: WC-II-III (1, 44, !), BC-I-II-III (23, 33, 35, !), FC-I (11, 50, 55, 57), FC-III (23); H, Cosm; Plantaginetea, Bidentetalia, Molinieta; C
106. *P. palustris* (L.) Scop. (*Comarum palustre* L.): FC-I (37, 55), FC-II (30); Hh, Cp (bor); Caricetalia *nigrae*, Alnetea; C
107. *P. supina* L.: FC-I (10, 11); Th-H, M; Nanocypeiron, Bidention; rC
108. *Sanguisorba officinalis* L.: WC-II-III (1, 23, !), BC-II-III (23), FC-III (23, 27); H, Eua; Molinieta; C

FABACEAE

109. *Amorpha fruticosa* L.: WC-III (43, !), BC-III (!), FC-I (11), DC (!); mPh, Adv; Salicion albae; C
110. *Galega officinalis* L.: WC-II-III (1, 28, 44, !), BC-I-II-III (14, 34, !), FC-I (55), DC (14); C f. *albiflora* Boiss.: BC-I (23, 34); H, P-M; Molinietalia, Calystegion
111. *Glycyrrhiza echinata* L.: WC-III (1, 23, 70, 44, !), BC-III (!), FC-III (70, !), DC, TC (70, !); H, P-M; Calystegion, Salicetea, Phragmitetea; rC
112. *Trifolium hybridum* L.: WC-I-II (1, 44, !), BC-I (23, 40), FC-I-II (10, 16), FC-III (23, 27), TC (70); C
- var. *elegans* (Savi) Boiss.: BC-I (23), FC-III (60); H, E (M); Molinietalia
113. *T. ornithopodioides* Sm.: WC-III (1, 23), BC-III (23); Th, Atl-M; Puccinellietalia; rC

GERANIACEAE

114. *Geranium palustre* Torner: BC-I (23), FC-I (37, 57), FC-II (16), FC-III (60); H, Eua (C); Filipendulo-Petasition; C

EUPHORBIACEAE

115. *Euphorbia palustris* L.: FC-III, DC, TC (70); H-Hh, E; Convolvuletalia, Filipendulo-Petasition, Agrostion-Beckmannion; rC
116. *E. serrulata* Thuill. (*E. stricta* L.): WC-II (1, !), BC-II-III (33, !), FC-I (11, 55); Th, E (C); Alno-Padion, Senecion fluviatilis, Calystegion; C

BALSAMINACEAE

117. *Impatiens noli-tangere* L.: WC-I (1, !), BC-I-II (35, 40, !), FC-I (10, 11, 50, 52, 55, !); Th, Eua; Alno-Padion; C

RHAMNACEAE

118. *Frangula alnus* Mill.: WC-I-II (1, !), BC-I (!), FC-I (11, 55, !), FC-III (42); mPh, Eua; Alno-Padion; C

VITACEAE

119. *Vitis silvestris* Gmel.: WC-II-III (1, !), BC-II-III (23), DC, TC (70); mPh, P-M; Salicion albae, Alno-Padion; C
120. *Parthenocissus inserta* (A. Kern.) K. Fritsch: WC-II (!), mPh, Adv; Salicion albae; C

HYPERICACEAE

121. *Hypericum humifusum* L.: BC-II (33, !); Th, Eua; Nanocyperion; rC
122. *H. tetrapterum* Fries. (*H. acutum* Moench.): WC-I-II (1, 23), BC-II-III (23, 35, !), FC-I (57); H, E; Filipendulo-Petasition, Glycerio-Sparganion, Magnocaricion; C

ELATINACEAE

123. *Elatine alsinastrum* L.: WC-III (70), BC-III (14), FC-III (60), DC (14), TC (14, 70); Hh (TH-H), Eua (M); Nanocyperion, Potamion; rC
124. *E. ambigua* Wigth.: FC-III (23); Hh, Eua; Nanocyperion; V
125. *E. hexandra* DC.: WC-III (1, 23); Hh, E; Nanocyperion; V
126. *E. hungarica* Moesz: WC-III (1, 23, 70), TC (14, 70); Hh, Eua (M); Nanocyperion-Potamion; V
127. *E. hydropiper* L.: WC-III (70), FC-III (60), TC (14); Hh (Th), Cp (bor); Nanocyperion; rC
128. *E. triandra* Schk.: FC-III (14, 60), DC, TC (14); Hh, Cp (bor); Oryzion; rC

CUCURBITACEAE

129. *Echinocystis lobata* (Mchx.) Torr. et Gray: WC-II-III (!), BC-III, DC(!); Th, Adv;
Calystegion-Senecion fluviatilis; C
130. *Sicyos angulata* L.: WC-III, FC-III (23); Th, Adv; Calystegion; K

LYTHRACEAE

131. *Lythrum hyssopifolia* L.: WC-III (1, 23), BC-II (!), BC-III (Herb. Pop), FC-III (23, 14, !),
DC (14), TC (8); rC
f. *kernerii* Janka: FC-I (23); Th, Cosm; Nanocyperion
132. *L. salicaria* L.: WC-I-II-III (1, 43, !), BC-I-II-III (23, 33, 35, !), FC-I-II-III (11, 23, 27, 30,
51, 55, 57, !), DC (8, 14, !), TC (14); C
f. *glabrescens* Neilr.: BC-II (23, 33), FC-III (23);
var. *tomentosum* DC.: FC-III (23); Hh, Cosm; Filipendulo-Petasition, Phragmitetea, Salicetea
133. *L. tribracteatum* Salzm.: BC-III (39), TC (8, 14, 70, 73); rC
var. *salzmännii*: BC-III (Herb. I. Pop); Th, Eua (C); Nanocyperion
134. *L. virgatum* L.: WC-III (1, 23, 43, !), BC-III (!), FC-III (!), DC (14), TC (8); H-Hh, Eua
(C); Agrostion-Beckmannion; C
135. *L. x scabrum* Simk. (*salicaria x virgatum*): WC-III (1, 23), FC-III (60)
136. *Peplis portula* L.: WC-II-III (1, 70), BC-II-III (14, !), FC-I (37, 55, 61), FC-III (23, 70), DC
(14), TC (14, 70); Th, Atl-M; Nanocyperion; C

TRAPACEAE

137. *Trapa natans* L.: WC-III (1, 23, 70), BC-III, DC (!), TC (73); rC
f. *conocarpa* Aresch.: WC-III (67, 70);
f. *cruciata* Glück: WC-III, TC (67);
f. *glückii* (f. *bicornis*): WC-III, TC (67);
f. *coronata* (incl. *hungarica*): TC (67);
f. *platyacantha*: WC-III, TC (70); Hh, Eua (M); Nymphaeion

ONAGRACEAE

138. *Epilobium adenocaulon* Hausskn.: WC-II (!); H, Adv; Filipendulo-Petasition, Molinietaia;
rC
139. *E. alsinifolium* Vill.: BC-I (23, 61), FC-I (57); C
var. *villarsii* (Lévl.) Thell.: BC-I (23); H, Eua; Montio-Cardaminetea
140. *E. dodonaei* Vill. (*Chamaenerion palustre* Auct.): FC-I-II-III (23, 60, !); H, Ec; Epilobion
flaischeri; C
141. *E. hirsutum* L.: WC-I (!), WC-II-III (1, !), BC-I-II (35, 40, !), FC-I (57), DC, TC (14); C
var. *villosum* (Roch.) Hausskn.: WC-III (70 with f. *eriocarpum* Borb.), BC-II (23, 34), DC (70)
var. *tomentosum* Hausskn.: BC-II (23, 34); H (Hh), Eua (M); Filipendulo-Petasition,
Phragmitetea
142. *E. obscurum* (Schreb.) Roth.: FC-I (10, 23, 51); H, Atl-M; Cardamino-Montion, Glycerio
-Sparganion; rC
143. *E. palustre* L.: WC-I-II (1, !), BC-I (35, 40, 41, !), FC-I (10, 37, 50, 52, 54, 55); C
f. *glandulosum* Hausskn.: BC-I (23, 34);
var. *fontanum* Hausskn.: BC-I (23, 28);
var. *pilosum* Hausskn.
f. *subdenticulatum* K. Rubner: BC-I (34);
f. *pilosum* Hausskn.: FC-I (55);
f. *subvillosum* (Schur) Borza: FC-I (55); H, Cp (bor); Caricetalia nigrae, Calthion
144. *E. parviflorum* (Schreb.) Wither: WC-I-II (1, !), BC-I-II-III (14, 33, !), FC-I (10, 11, 50,
55, 57), DC (14); C

- f. *mollissimum* Welw.: BC-II (23, 34); H, Eua; Glycerio-Sparganion, Molinietaia
145. *E. roseum* (Schreb.) Pers.: WC-II, BC-I (23), FC-I (52), FC-III (60); H, Eua; Glycerio-Sparganion; rC
146. *E. tetragonum* L. (*E. adnatum* Gris.): WC-I-II-III (1, 23), DC, TC (70); H, Eua; Agrostion-Magnocaricion; rC
147. *E. x dacicum* Borb. (*obscurum x parviflorum*): FC-I (55)
148. *E. x finitimum* Hausskn. (*alsinifolium x nutans*): BC-I (23, 61)
149. *E. x haynaldianum* Hausskn. (*alsinifolium x palustre*): FC-I (55)
150. *E. x subhirsutum* Genn. (*hirsutum x parviflorum*): FC-III (23)
151. *Ludwigia palustris* (L.) Elliot: WC-III (1, 23, 67, 70); Th-Hh, Atl-M; Magnocaricion; R

HALORAGACEAE

152. *Myriophyllum spicatum* L.: WC- III, BC-II-III (!), FC-I (11), FC-III (!), TC (73); Hh, Cp (bor); Potamion, Nymphaeion; C
153. *M. verticillatum* L.: WC-III (70), BC-III (!), FC-III, TC (70); K
- f. *pinnatifidum* Koch: FC-III (60); Hh, Cp (bor); Nymphaeion, Potamion

APIACEAE

154. *Aegopodium podagraria* L.: WC-I-II (1, 44, !), BC-I-II-III (39, 40, !), FC-I-II-III (11, 42, 53, !); H (G), Eua; Alno-Padion; C
155. *Angelica archangelica* L.: FC-I (52, 55, 56); TH-H, Eua (bor); Adenostyletea; V
156. *A. silvestris* L.: WC-I-II (1, !), WC-III (!), BC-I (40, !), FC-I (11, 55, 61); rC
- var. *elatio* Wahlbg.: BC-II (23), FC-III, DC (70); H, Eua (C); Alnion glutinosae, Molinietaia
157. *Chaerophyllum hirsutum* L.: (*C. cicutaria* Vill.): FC-I (10, 23, 49, 50, 52, 55); rC
- f. *rubriflorum* (DC.) Borza: FC-I (55); H, Ec; Filipendulo-Petasition
158. *Heracleum palmatum* Baumg.: FC-I (52); H, End; Adenostylon; R
159. *Oenanthe aquatica* (L.) Poir.: WC-III (1), BC-III (14), FC-II (16), FC-III (!), TC (14); Hh, Eua; Phragmitetalia; rC
160. *O. banatica* Heuff.: WC-II-III (1, 23), BC-II (23, 34), FC-I (23, 37, 55), FC-III (23, 60, 70); H, D-B-Pn; Alno-Padion; rC
161. *O. sialifolia* M. B.: WC-II-III (1, 23, 70), BC-II (23), FC-I (11, 23), TC (14); rC
- var. *media* (Gris.) Beck: FC-III (23, 70), TC (70); H, M; Agrostion stoloniferae
162. *Selinum carvifolia* L.: WC-II-III (23), FC-I (11), FC-III (23, 60); H, Eua; Molinion; rC
163. *Sium erectum* Huds. (*Berula erecta* (Huds.) Covil.): WC-II-III (1, !); Hh, Cp (bor); Glycerio-Sparganion, Magnocaricion, Alno-Padion; C
164. *S. latifolium* L.: FC-I (!), FC-II (16), FC-III (23); Hh, Eua; Phragmition; C
165. *S. sisarum* L.: (*S. lancifolium* M.B.): WC-II-III (1); Hh, Eua (C); Phragmition; rC

ERICACEAE

166. *Andromeda polifolia* L.: FC-I (37, 38); Ch-nPh, Cp (bor); Sphagnetalia fusci; Ex?
167. *Vaccinium oxycoccos* L.: FC-I (23, 37); Ex?
- ssp. *microcarpum* (Turcz.) M. N. Blytt: FC-I (37); Ch (bor); Sphagnetalia fusci

PRIMULACEAE

168. *Centunculus minimus* L.: WC-II-III (1, 23, 61), FC-I (57); Th, Eua; Nanocyperion; R
169. *Hottonia palustris* L.: FC-III (60, 67, 70); Hh, E; Potamion; E
170. *Lysimachia nemorum* L.: FC-I (11); H, E; Cardamino-Montion; R
171. *L. nummularia* L.: WC-II-III (1, 43, !), BC-I-II (35, 40, 41, !), FC-I (10, 11, 55, !), TC (14); Ch, E; Alno-Padion, Calthion, Filipendulo-Petasition, Phragmitetalia, Plantaginetea; c
172. *L. vulgaris* L.: WC-II-III (1, 43, !), BC-I-II-III (35, 40, !), FC-I-II (11, 30, 55, !), TC (14); C

f. pubescens (Maisch et Vollm.) Borza: FC-I (55); H-Hh, Eua; Phragmitetea, Molinio-Juncetea, Alnetea

OLEACEAE

173. *Fraxinus angustifolia* Vahl.: FC-I (57); MPh, P-Pn; Alno-Padion; rC

GENTIANACEAE

174. *Blackstonia perfoliata* (L.) Huds.; E

ssp. *serotina* (Koch) Wollm.: TC (73); TH, Atl-M; Nanocyperion

175. *Centaureum littorale* (D. Turner) Gilmour (C. *uliginosum* (W. et K.) G. Beck): TC (14); Th-TH, Eua; Molinietales; R

176. *C. pulchellum* (Sw.) Druce: WC-II (1, 23), BC-II (33, !), FC-III (23, !), TC (14);

f. *meyer* Bge.: BC-II (34); Th, Eua; Nanocyperion-Molinietales; rC

177. *Gentiana pneumonanthe* L.: WC-II (1, 23), BC-I (33); H, Eua (M); Molinion; rC

178. *Swertia perennis* L.; E

var. *alpestris* (Baumg.) Sag. et Schn.: BC-I (23, 36); H, Eua (bor); Scheuchzerio-Caricetea nigrae

179. *S. punctata* Baumg.: BC-I (28, 61), FC-I (10); H, Carp-B; Adenostylon; E

MENYANTHACEAE

180. *Menyanthes trifoliata* L.: FC-I (37, 55), FC-II (30); Hh, Cp (bor); Magnocaricion, Caricetalia nigrae; V

181. *Nymphoides peltata* (Gmel.) O. Ktze.: WC-III (1, 23, 70), BC-III (70), FC-III (60, 70), TC (70); Hh, Eua (M); Nymphaeion; V

RUBIACEAE

182. *Galium palustre* L.: WC-II-III (1, !), BC-I-II (35, 40, 41, !),

FC-I (10, 11, 50, 52, 54, 55, !), FC-II (16, 30), FC-III, DC (70); H, Cp; Magnocaricion, Molinio-Juncetea; C

183. *G. rivale* (Sibth. et Sm.) Gris. (*Asperula rivalis* Sibth. et Sm.): WC-III, FC-I, FC-III (23); H, Eua; Alno-Padion; rC

184. *G. rubioides* L.: WC-II-III (1, !), BC-I (40), BC-III (!), FC-III (23), DC (70, !); H, Ec; Calystegion; rC

185. *G. uliginosum* L.: WC-III (!), FC-I (37, 57), FC-III (23); H, Eua; Molinietales, Magnocaricion; rC

CONVOLVULACEAE

186. *Calystegia sepium* (L.) R. Br.: WC-I-II-III (1, !), BC-II-III (!), FC-I (11, 55, 57, !), FC-III (23), DC(!); H, Eua; Calystegion, Salicion; C

BORAGINACEAE

187. *Myosotis caespitosa* C. F. Schultz: WC-II-III (1), FC-I (23); Th-TH (H), Cp; Phragmition, Magnocaricion; C

188. *M. scorpioides* L. (*M. palustris* (L.) Hill.): WC-I-II-III (1, 70, !), BC-I-II (33, 35, 40, 41, !), FC-I-II (10, 11, 16, 30, 49, 52, 55, !), DC (70); C

var. *elator* Opiz: WC-II (1), FC-I-II (10, 23); Hh, Eua; Calthion, Phragmitetea, Alnetea

189. *Symphytum officinale* L.: WC-II-III (1, 44, !), BC-III (!), FC-I (11, 49, 55, !), FC-II (16, !), FC-III (14, 27), DC (14), TC (8); C

ssp. *uliginosum* (Kern.) Nym.: FC-I (23), FC-III (23, 70), DC (70);

f. *inundatum* Menyh.: FC-III (70); H, Eua; Molinietales, Phragmitetea, Alno-Padion

CALLITRICHACEAE

190. *Callitriche cophocarpa* Sendtn. (C. polymorpha Lönner.): WC-II-III (1, 70, 44), BC-II (!), FC-I (11), FC-III (23, 60, 70); Hh, Eua; Nanocyperion, Potamion; R
191. *C. palustris* L. em. Druce (C. verna L.): WC-II-III (1, 44, !), BC-II (35, !), FC-I (10), FC-II (30), FC-III (23, 68), DC (9), TC (68); R
f. *minima* (L.) Topa: FC-III (23); Hh, Cp (bor); Potamion, Nanocyperion

LAMIACEAE

192. *Lycopus europaeus* L.: WC-I-II-III (1, !), BC-I-II-III (35, !), FC-I-II (11, 30, 55, 57, !); Hh, Eua; Phragmitetea, Bidentetea, Alnetea; C
193. *L. exaltatus* L.: FC-I (11), FC-III (23, 70), DC (8, 70), TC (70); Hh, Eua (C); Phragmitetea, Bidentetea, Salicion albae; C
194. *Mentha aquatica* L.: WC-II-III (1, !), BC-II (!), FC-I (11, 37, 49, 50, 55, !), FC-II (16, 30, !), FC-III (70, !); C
var. *stagnalis* Top.: FC-III (8, 70);
var. *riparia* (Schreb.) Gusul.: FC-I (70);
var. *capitata* (Op.) Briq.: TC (70); Hh-H, Eua; Phragmitetalia, Alnetea, Salicion, Molinieta
195. *M. arvensis* L.: WC-I-II-III (1, !), BC-I-II-III (35, !), FC-I (10, 11, 54, 55, 57), DC, TC (14); C
ssp. *arvensis*
var. *duftschmidii* Top.: FC-III (23);
var. *pasuorum* Top.: FC-III (8, 60);
var. *foliicola* (Op.) Top.: FC-I (55);
ssp. *austriaca* (Jacq.) Briq.
var. *austriaca*: FC-I (55), TC (14);
var. *hostii* (Bor.) Top.: FC-I (23);
var. *fontana* (Weihe) Top.: FC-I (23); H-G, Cp (bor); Phragmitetea, Molinieta
196. *M. longifolia* (L.) Nath.: WC-I-II-III (1, !), BC-I-II-III (34, 35, 40, !), FC-I-II-III (10, 11, 52, 55, !), DC (!); C
ssp. *longifolia*
var. *huguenini* (Dés et Dur.) Briq.: FC-III (23);
var. *horridula* Briq.: FC-III (70);
var. *recta* (Dés et Dur.) Top.: FC-III (70);
var. *vallesiaca* (Briq.) Trauttm.: FC-I (55);
ssp. *mollissima* (Borkh.) Dom.
var. *eclytanthea* Top.: FC-III (23);
var. *hollosyana* (Borb.) Top.: FC-III (23);
var. *leioneura* (Borb.) Top.: WC-III, FC-III (70);
f. *herbosa* Top.: WC-III (23);
ssp. *incana* (Willd.) Gusul.
var. *subincana*: FC-III (8);
var. *szabolcsensis* Top.: WC-III (23); H (G), Eua (M); Molinieta, Glycerio-Sparganion, Filipendulo-Petasition, Bidentetea, Agropyro-Rumicion
197. *M. pulegium* L.: WC-II-III (1, !), BC-III (!), FC-III (!), DC (70), TC (8, 70); C
var. *hirsuta* (Pér.) Briq.: FC-III (23), DC, TC (70); H, Eua (M); Nanocyperion, Agropyro-Rumicion, Agrostion
198. *M. x dalmatica* Tausch (*arvensis* x *longifolia*): WC-II (1);
var. *bihariensis* (Borb.) Briq.: FC-III (8);
var. *skofitziana* (A. Kern.) Briq.: WC-II (23, 44)
199. *M. x dumetorum* Schultes (*aquatica* x *longifolia*) (*M. x hirta* Willd.)

- f. *bradensis* Prod.: WC-I (23);
 f. *beiusensis* Prod.: BC-II (23)
 200. *M. x iraziana* Borb. (*arvensis* x *longifolia* ssp. *incana*): FC-III (8);
 var. *peracuta* (Borb.) Gusul.
 f. *vășcăuensis* Prod.: BC-II (23);
 var. *saftae* Prod.: WC-I (23)
 201. *M. x subspicata* Weihe (*aquatica* x *verticillata*): FC-III (60)
 202. *M. x verticillata* L. (*arvensis* x *aquatica*): BC-I (34, !), FC-I (61);
 f. *dorealis* (Top.) Gusul.: FC-III (23, 60)
 203. *Scutellaria galericulata* L.: WC-I-II-III (1, !), BC-II (!), FC-I (11, 37, 55, 57, !), FC-III (23, 70), DC (70); H, Cp (bor); Magnocaricion, Phragmitetea, Molinietaia; C
 204. *S. hastifolia* L.: WC-II-III (1, 23, !), FC-I (55), FC-III (23, 27), TC (8, 14); H, Ec; Molynietaia, Calystegion; C
 205. *Stachys palustris* L.: WC-I-II-III (1, 43, !), BC-I-II-III (35, !), FC-I (11, 57); H (G), Cp (bor); Phragmitetea, Filipendulo-Petasion, Alnetea; C
 206. *Teucrium scordium* L.: WC-II (1, 23), FC-III (23); H, Eua (M); Magnocaricion, Agrostion; rC

SOLANACEAE

207. *Solanum dulcamara* L.: WC-III (!), BC-I (40), BC-II-III (35, !), FC-I (11, 57), FC-III (!), DC (!); Ch (nPh), Eua (M); Phragmition, Alno-Padion, Calystegion; C

SCROPHULARICEAE

208. *Gratiola officinalis* L.: WC-II-III (1, 28, 61, !), BC-I-II (33, 35, !), FC-I (55), FC-III (14), DC, TC (14); H, Eua; Phragmitetea, Molinion-Magnocaricion; C
 209. *Limosella aquatica* L.: WC-III (70), FC-III (23, 60), TC (14, 70); Th, Cosm; Nanocyperion; V
 210. *Lindernia procumbens* (Krocker) Phicox (*L. pyxidaria* L. p.p.): WC-II-III (1, 23, 61), BC-II (!), FC-I (23), FC-III (23, 60), TC (8, 70); Th, Eua (M); Nanocyperion; rC
 211. *Pedicularis limnogenia* A. Kern.: FC-I (10, 38, 50); H, Carp-B; Scheuchzerio-Caricetea nigrae; V
 212. *P. palustris* L.: FC-II (16); H, Eua; Caricetalia davallianae; V
 213. *Scrophularia umbrosa* Dumort (*S. alata* Auct.): FC-I (11, 57, !); H, Eua; Glycerio-Sparganion, Alno-Padion; C
 214. *Veronica acinifolia* L.: WC-III (1, 23), FC-III (23); Th, M; Nanocyperion-Beckmannion; rC
 215. *V. anagalloides* Guss.: FC-III (60), DC (70); H-Hh, Eua; Phragmitetea, Isoeto-Nanojuncetea, Bidentetea; C
 f. *levistipes* Borb.: FC-I (10, 23)
 216. *V. anagallis-aquatica* L.: WC-III (1, 70), BC-I-II (35, 40, 41, !), FC-I (11, 55, 57), FC-III (!), DC (14); C
 f. *limosa* Krösche: FC-III (23); H-Hh, Cp (bor); Phragmitetea, Bidentetea
 217. *V. beccabunga* L.: WC-II-III (1, 63, 70, !), BC-I-II-III (33, 35, !), FC-I-II (11, 16, 50, 52, 55, 61, !); C
 f. *limosa* (Lej.) Math.: FC-I (55); Hh-H, Eua; Glycerio-Sparganion, Bidentetea, Populetaia
 218. *V. scutellata* L.: WC-III (1, 23), FC-I (23, 54, 55), FC-III (23), TC (14, 70); C
 var. *pilosa* Vahl.: WC-III (1, 23);
 var. *villosa* Schumacher: WC-III (1, 23); H-Hh, Cp; Magnocaricion-Agrostion, Caricion canescenti-nigrae

LENTIBULARIACEAE

219. *Utricularia vulgaris* L.: WC-III (23, !), BC-III (39, !), FC-I (30), FC-III (14, 70), DC, TC (14); Hh, Cp; Lemnion, Nymphaeion; rC

ADOXACEAE

220. *Adoxa moschatellina* L.: WC-II (23), BC-I (36), FC-I (10, 50, 55, 57); H, Cp (bor); Alno-Padion; R

VALERIANACEAE

221. *Valeriana officinalis* L.: WC-I-II (1, !), BC-I-II (35, 40, !), FC-I (11, 55, 56); C

var. *tenuifolia* Vahl.: FC-I (11, 23), DC (70);

var. *latifolia* Vahl.: WC-II (70);

f. *altissima* (Hornem.) Koch: WC-II (70), FC-I (11); H Eua (M); Magnocaricion, Molinieta, Filipendulo-Petasition, Alno-Padion

222. *V. sambucifolia* Mikan: FC-I (10, 11, 52); H, Ec; Filipendulo-Petasition, Adenostyleta; R

223. *V. simplicifolia* (Rchb.) Kabath: FC-I (23, 37); H, Ec; Caricion davallianae, Eriophorion latifolii; R

DIPSACACEAE

224. *Dipsacus pilosus* L. (*Cephalaria pilosa* (L.) Gren.): WC-I-II (1, !), FC-I (57); TH, Atl-M; Alno-Padion; rC

225. *Succisa pratensis* Mnch.: WC-II (1, 23), FC-I (10, 50, 54, 55); rC

f. *glabrata* (Schott) Jáv.: FC-I (37); H, Eua; Molinieta

226. *Succisella inflexa* (Kluk) Beck: WC-III (1, 23), FC-I (11); H, Ec; Molinieta; rC

ASTERACEAE

227. *Adenostyles alliariae* (Gouan) A. Kern.

ssp. *kernerii* Simk.: BC-I (23), FC-I (10, 23, 52); H (G), E; Adenostyleta; R

228. *Aster punctatus* W. et K.; C

ssp. *punctatus*: WC-III (23, 70), FC-I (49), FC-III (23, 70), DC, TC (70);

var. *latifolius* (Roch.) Borb.: WC-III (1), FC-III (8);

var. *canescens* Simk.: FC-III (23, 70), TC (70);

var. *squamosus* (Lallem.) Morariu et Nyár.: WC-III (70); H, Eua (C); Puccinellietalia

229. *A. tripolium* L.: DC (8);

ssp. *pannonicus* (Jacq.) Beck: DC (14); H, Eua (M); Puccinellietalia; R

230. *Bidens cernua* L.: WC-II-III (1, 70), FC-III (70); Th, Eua; Bidention; rC

231. *B. tripartita* L.: WC-I-II-III (1, !), BC-I-II-III (!), FC-I (11, 55), FC-II-III (!); Th, Eua; Bidentetia; C

232. *Carduus personata* (L.) Jacq.: BC-I (40, 41), FC-I (10, 23, 49, 52, 55, 56); C

var. *simplicifolius* Sanguin.: FC-I (10, 55); H, Ec; Adenostylion, Filipendulo-Petasition, Alno-Padion

233. *Chrysanthemum serotinum* L.: DC, TC (70); H, P-Pn; Phragmition; R

234. *Cicerbita alpina* (L.) Wallr.: FC-I (10, 52, 55); H, E; Betulo-Adenostyleta; K

235. *Cirsium brachycephalum* Jur.: WC-III (23); TH-H, Pn (End); Agrostio-Beckmannion, Magnocaricion; rC

236. *C. canum* (L.) All.: WC-II-III (1, 70), BC-I (!), FC-I (10, 11, 55), FC-III (27); G, Eua (C); Molinio-Juncetia, Magnocaricion, Alno-Padion; C

237. *C. erisithales* (Jacq.) Scop.: BC-I-II (35, 36), FC-I (10, 49, 50, 55, 56); H, Ec; Filipendulo-Petasition; C

238. *C. helenioides* (L.) Hill. (*C. heterophyllum* (L.) Hill.): FC-I (37); G, Eua; Filipendulo-Petasition; K
239. *C. oleraceum* (L.) Scop.: WC-II-III (1), BC-I-II (40, !), FC-I (10, 11, 49, 52, 55); H, Eua; Filipendulo-Petasition, Alno-Padion, Calthion; C
240. *C. palustre* (L.) Scop.: BC-I-II (35), FC-I (10, 37, 54, 55, 56), FC-III (60); TH, Eua (M); Phragmitetea, Molinio-Juncetea; C
241. *C. rivulare* (Jacq.) Link.: WC-I-II (1), BC-I (40), FC-I (37, 56, 57), FC-II (16); H, Ec; Calthion, Molinion, Magnocaricion, Alno-Padion; C
242. *C. x candolleianum* Naeg. (*erisithales x oleraceum*): FC-I (55)
243. *Crepis paludosa* (L.) Moench.: WC-I (1), BC-I-II (35, 36), FC-I (10, 37, 49, 52, 55), FC-II (16); H, E; Calthion, Montio-Cardaminetea, Alno-Padion, Adenostyletalia; C
244. *Eupatorium cannabinum* L.: WC-I-II-III (1, 23, 63, !), BC-I-II (23, 33, 35, 36, 40, !), FC-I (11, 23, 55, !), FC-III (8, 18), DC (8); H, Eua; Filipendulo-Petasition, Phragmitetea, Alnion glutinosae; C
245. *Gnaphalium uliginosum* L.: WC-II (1), BC-II (!), FC-I (10, 55); C
f. *pilulare* (Wahlbg.) Nyár.: FC-I (10, 23);
f. *pseudopilulare* Scholz: BC-II (23); Th, Eua; Nanocyperion
247. *Helianthus decapetalus* L.: WC-II-III, BC-III (!); H, Adv; Salicetalia purpureae; C
247. *Inula helenium* L.: WC-II (1), BC-II (23), FC-III (23); H, Adv; Alno-Padion, Senecion fluviatilis; C
248. *Petasites hybridus* (L.) G. M. Sch.: WC-I-II (1, !), BC-I-II (35, 40, !), FC-I (10, 11, 52, 55, !), FC-II (!); H (Hh), Eua; Alno-Padion, Adenostyletalia, Filipendulo-Petasition; C
249. *Pulicaria dysenterica* (L.) Gaertn.: WC-II-III (1, 23, 70), BC-II-III (33, 35, !), FC-III (23), DC (!); H, E (M); Agropyro-Rumicion, Molinieta; C
250. *P. vulgaris* Gaertn.: WC-II-III (1, 23), BC-II (!), FC-III (!), TC (8); Th, Eua (M); Agropyro-Rumicion, Bidention, Isoeto-Nanojuncetea; C
251. *Rudbeckia laciniata* L.: WC-II (1, 23), WC-III (!), BC-III (!), FC-I (55), FC-II (16); H, Adv; Calystegion; C
252. *Senecio barbaraeifolius* (Krok.) Wimm. et Grab.: WC-II (1, 23), BC-I-II, FC-III (23); C
var. *erraticus* Bertol.: FC-III (23); H, Ec; Molinieta, Magnocaricion
253. *S. fluviatilis* Wallr.: FC-III (23, 60); H, Eua (C); Senecion fluviatilis; K
254. *S. paludosus* L.: WC-III (23), FC-I (52), DC (70), TC (8); H, Eua; Caricion rostratae; C
var. *glabratus* Koch: DC (70);
var. *tomentosus* (Host) Koch: DC (70)
255. *Solidago canadensis* L.: WC-II (1, 23, 44), BC-III (!); H, Adv; Calystegion; rC
256. *S. gigantea* Ait. (*S. serotina* Ait.): WC-II-III (1, 23, 43, 70, !), BC-III (!), DC (!); H, Adv; Calystegion, Salicetea; C
257. *Taraxacum palustre* (Lyons) Symons: FC-II (16); K
f. *scorzoneria* (Gaud.) Hay.: FC-II (16); H, E; Eriophorion-Molinion
258. *Telekia speciosa* (Schreb.) Baumg.: WC-I-II (1, !), BC-I (33, 40, !), FC-I (10, 11, 50, 52, 55, !); H, Carp-B-Cauc; Filipendulo-Petasition, Alnion incanae; C

ALISMATACEAE

259. *Alisma gramineum* Lej.: WC-III (70), FC-III (18); Hh, Cp; Nanocyperetalia, Phragmition; V
260. *A. lanceolatum* Wither: WC-I-II-III (1, 70, !), BC-II (!), FC-II-III (16, 23, 70, !), DC, TC (70); Hh, Eua; Phragmitetea; C
261. *A. plantago-aquatica* L.: WC-II-III (1, !), BC-II-III (33, !), FC-I (11, 55, !), FC-II-III (14, 18, 30, 31, !), DC (!), TC (14, !); Hh, Cosm; Phragmitetea; C
262. *Sagittaria sagittifolia* L.: WC-II-III (1, 23, 70, !), FC-III, TC (70, !); rC

f. *heterophylla* (Schreb.) Bolle: FC-III, DC, TC (70)

f. *divaricata* (Schur); Hh, Eua (M); Phragmition

263. *S. subulata* (L.) Buch.: FC-III (I. Pop, 1973); Hh, Adv; Phragmition; V

BUTOMACEAE

264. *Butomus umbellatus* L.: WC-III (1), BC-II (!), FC-III (18, 31, !), DC (!), TC(8); Hh, Eua (M); Phragmitetia; C

HYDROCHARITACEAE

265. *Hydrocharis morsus-ranae* L.: WC-II-III (1, 23, !), BC-III (39, !), FC-III (60, 66, 70, !), DC (8), TC (!); Hh, Eua; Hydrocharition, Lemnion; rC

266. *Stratiotes aloides* L.: WC-I (1, 23), WC-III (23), FC-III (60); Hh, Eua; Hydrocharition, Lemnion; R

267. *Vallisneria spiralis* L.: FC-III (!); Hh, Cosm; Potamion; E

JUNCAGINACEAE

268. *Scheuchzeria palustris* L.: FC-I (23, 37); G, Cp (bor); Scheuchzerio-Caricetalia nigrae; E

269. *Triglochin palustris* L.: WC-III (1, 23), FC-I (57), TC (70); H, Cp (bor); Molinio-Juncetia, Scheuchzerio-Caricetia nigrae; K

POTAMOGETONACEAE

270. *Potamogeton crispus* L.: WC-III, BC-III (!), FC-I (11, 55), FC-III (14, 18, !), DC (!), TC (70, 73, !); C

f. *serrulatus* (Schr.) Topa: FC-I (55); Hh, Cosm; Potametalia

271. *P. lucens* L.: DC (14), TC (14, 70, 73); Hh, Eua (M); Potamion; R

272. *P. natans* L.: WC-III (70, !), BC-II (33, !), FC-III (14, 18, 70), DC, TC (14); C

var. *prolixus* Koch: FC-III (65)

f. *ovalifolius* Fieb.; Hh, Cosm; Potamion, Nymphaeion

273. *P. nodosus* Poir. (*P. fluitans* Roth p.p.): WC-III, BC-III (!), FC-III (14, 34, !), DC (14, !), TC (14, 70, !); C

var. *billotii* (F. Schutz) Richter: FC-III (23, 65);

var. *stagnalis* Koch: FC-III (!); Hh, Cp (bor); Potametalia, Batrachion fluviatilis

274. *P. gramineus* L.: FC-III (70), DC, TC (14); rC

var. *heterophyllus* Fr.: DC, TC (14);

f. *myriophyllus*: TC (70); Hh, Cp (bor); Potamion

275. *P. pectinatus* L.: WC-III (70), BC-II (34), FC-III (14, 60), DC (14, 65, 70), TC (14); C

var. *scoparius* Wallr.: DC (70), TC (14);

var. *dichotomus*: FC-III (31);

f. *vaillantii*: FC-III (70); Hh, Cosm; Potamion

276. *P. obtusifolius* Mert. et Koch: FC-I (55); Hh, Cp (bor); Potamion; E

277. *P. pusillus* L.: BC-II, FC-I (!), FC-III, DC (14); R

var. *major* Mert. et Koch (*P. berchtoldii* Fieber): FC-I (!);

f. *retifolius* Fisch.: FC-I (23);

f. *mucronatus* Fieb.: WC-III (65);

var. *tenuissimus* Mert. et Koch: BC-II (33); H, Cosm; Potamion

278. *P. trichoides* Cham. et Schlecht.: FC-III (!); H, Eua; Potamion; E

ZANNICHELLIACEAE

279. *Zannichellia palustris* L.: WC-III (70, !), FC-III, DC (70), TC (70, !); R

ssp. *pedicellata* Wahlbg. et Rosen: WC-III (65), FC-III (60, 65), DC (66);

var. *aculeata* Schur: WC-III, FC-III, DC (66); Hh, Cosm; Potamion, Ruppion

NAJADACEAE

280. *Najas marina* L.: BC-III, FC-III, DC, TC (!)Hh, Cosm; Potamion; rC
281. *N. minor* All.: WC-III (1, 23, 66, 69), BC-III (!), FC-III (14, 60, 66, 70, !), DC, TC (14, !); Hh, Eua; Potamion, Ruppion; rC

LILIACEAE

282. *Veratrum album* L.: FC-I (55); G, Eua; Molinion, Adenostyletalia, Rumicion alpini; C

AMARYLLIDACEAE

283. *Leucojum aestivum* L.: DC (70); G, Atl-M; Salicion albae, Calthion; rC

IRIDACEAE

284. *Gladiolus imbricatus* L.: BC-I (40), FC-I (37, 52, 55); G, Eua (C); Alno-Padion, Trisetio-Polygonium; rC
285. *Iris pseudacorus* L.: WC-II (1), BC-III (!), FC-I (11); G-Hh, E; Phragmitetalia, Alnetea; C
286. *I. sibirica* L.: FC-I (11); G, Eua (C); Molinion; K
287. *I. spuria* L.: WC-II-III (1); G, Pn-D; Molinion; K

JUNCACEAE

288. *Juncus alpinus* Vill.: FC-I (50); rC
var. *fuscoater* Schreb.: FC-I (37, 54);
var. *carpaticus* (Simk.) Degen: FC-I (10); H, Cp (bor); Caricion lasiocarpae, Caricetalia davallianae
289. *J. articulatus* L.: WC-I-II-III (1, !), BC-I-II-III (35, 40, 41, !), FC-I (10, 11, 50, 55), FC-II (!); H, Cp (bor); Nanocyperion, Calthion, Agropyro-Rumicion; C
290. *J. atratus* Krock.: WC-III (1), BC-I-II-III (34, 35, !), FC-I (55), FC-III (60), TC (14); H, Eua (C); Agrostion; C
291. *J. bufonius* L.: WC-II-III (1, !), BC-I-II (3, 33, 35, !), FC-I (11, 37, 51, 55), TC (14); Th, Cosm; Nanocyperetalia, Bidentetea; C
292. *J. compressus* Jacq.: WC-II (1), BC-I (40, 41, !), BC-III (14), FC-I (52, 55), DC, TC (8, 14); G, Eua; Nanocyperion, Agrostion; C
293. *J. conglomeratus* L.: WC-I-II-III (1, 70, 44, !), BC-I-II (8, 34, !), FC-I (10, 11, 37, 50, 55), FC-III (14), DC (70); H, Eua; Molinietales, Caricion nigrae; C
294. *J. effusus* L.: WC-I-II-III (1, !), BC-I-II (35, 41, !), FC-I (10, 11, 37, 49, 50, 55), FC-II (16, 30, !); C
var. *compactus* Lej. et Court.: BC-I (23), FC-I (37); H, Cosm; Molinietales, Alnetea, Bidentetea
295. *J. filiformis* L.: FC-I (50); R
var. *transsilvanicus* Schur: BC-I (23);
f. *flaccida* Borza et Nyár.: FC-I (10, 23); H, Cp; Caricion canescenti-nigrae
296. *J. gerardi* Lois.: WC-II-III (1), FC-I (11), FC-III (70), TC (14); G, Cp (bor); Agropyro-Rumicion, Juncion gerardi; R
297. *J. inflexus* L.: WC-I-II (1, !), BC-I-II (33, 35, 40, !), FC-I (10, 11, 50, 52, 55); C
var. *oligocarpus* A. et G.: BC-I (23); H, Eua (M); Agropyro-Rumicion
298. *J. thomassii* Ten.: BC-I (23), FC-I (23); H, D-B; Molinietales; R

POACEAE

299. *Agrostis canina* L.: WC-II (44), BC-I (33), FC-I (37, 54, 55); C
var. *mutica* Gaud.: FC-I (23, 37); H, Eua; Molinio-Juncetea, Caricion canescenti-nigrae
300. *A. stolonifera* L.: WC-I-II-III (1, 43, 44, !), BC-I-II-III (34, !), FC-I (11, 55), FC-II (16, 30, !), FC-III (27, !), DC (!), TC (73); C
f. *vivipara*: BC-II (34); H, Cp (bor); Agrostion stoloniferae, Agropyro-Rumicion

301. *Alopecurus aequalis* Sobol.: WC-II (1), BC-III (14), FC-I (55), FC-II (30), TC(14); H, Cp (bor); Nanocyperion, Bidentetalia; C
302. *A. geniculatus* L.: FC-I (11, 50, 57), BC-III (14); H, E; *Agrostion stoloniferae*, *Agropyro-Rumicion*, *Beckmannion*; rC
303. *A. pratensis* L.: WC-II (44), WC-III, BC-II (!), FC-I (11, 49), FC-II (16, !), FC-III (27), TC (8, 72, !); H, Eua; *Agrostion*, *Calthion*, *Filipendulo-Petasisition*; C
304. *Beckmannia eruciformis* (L.) Host.: WC-III (1, 23), FC-III (14, 23), TC (8, 14, 73); H, Cp; *Beckmannion*; rC
305. *Calamagrostis pseudophragmites* (Haller fil.) Köeler: WC-II-III (1, 70, !), BC-II (33, !), FC-I (11, 55, 57), FC-III (60, !); H, Eua (C); *Salicion eleagni*, *Epilobion fleischeri*; C
306. *Catabrosa aquatica* (L.) P. Beauv.: BC-III (!), FC-I-II (16, 57), DC (!); H, Cp (bor); *Glycerio-Sparganion*, *Bidentetia*; C
307. *Deschampsia caespitosa* (L.) P. Beauv.: WC-I-II (1, !), BC-I-II (!), FC-I (49, 52, 55), FC-III (27); C
- f. *varia* (Wimm. Et Grab.) Nyár.: BC-I (34), FC-I (10);
- f. *altissima* (Mnch.) A. et G.: FC-I (10); H, Cosm; *Molinietalia*, *Adenostyletalia*
308. *Festuca arundinacea* Schreb.: WC-III (1, 70); H, Ec; *Molinietalia*, *Agrostion*, *Agropyro-Rumicion*; rC
309. *F. gigantea* (L.) Vill.: WC-II (1), BC-I (40), BC-III (Herb. I. Pop), FC-I (55), DC (70); H, Eua; *Alno-Padion*; rC
310. *F. pratensis* Huds.: WC-III (70), BC-I-II (33, 35), FC-I (11), FC-II (16, !), FC-III (27), DC, TC (70); H, Eua; *Molinio-Arrhenatheretea*; C
311. *Glyceria fluitans* (L.) R. Br.: WC-II-III (1, !), BC-II-III (!), FC-I (55), FC-III, TC (14); C var. *poaeformis* Fr.: TC (8); Hh-H, Cosm; *Glycerio-Sparganion*
312. *G. maxima* (Hartm.) Holmberg: WC-II-III (1, !), BC-II (!), FC-I (55, 57, 70), FC-II (16), FC-III (!), TC (14); Hh-H, Cp; *Phragmition*; C
313. *G. nemoralis* Uechtr.: BC-I-II (34, 35, !), FC-I (57); Hh, Ec-Sarm; *Cardamino-Montion*; rC
314. *G. plicata* Fries.: BC-II (!), FC-I (10, 11, 49, 55), FC-II (30, !), TC (14); Hh, Eua (bor); *Glycerio-Sparganion*; rC
315. *Heleocholea alopecuroides* (Piller et Mitterp) Host.: WC-III (1), BC-III (!), FC-III (60); Th, Eua; *Cypéro-Spergularion*; C
316. *Leersia oryzoides* (L.) Sw.: WC-I-II-III (1, 63, 70, !), BC-II (!), FC-III (60, 70); Hh, Cp (bor); *Glycerio-Sparganion*, *Bidentetia*; C
317. *Molinia coerulea* (L.) Moench.: WC-II (1), FC-I (10, 37, 50, 55); H, Eua; *Molinion*; C
318. *Phalaris arundinacea* L. (*Typhoides arundinacea* (L.) Mnch.): WC-II (1), BC-II (!), FC-II (16), TC (8); C
- f. *pallida* Sw.: BC-II (34); Hh-H, Cp (bor); *Agrostion stoloniferae*, *Caricion gracilis*
319. *Phragmites australis* (Cav.) Trin. et Steud.: WC-II-III (1, 44, !), BC-II-III (34, 35, !), FC-I (11, 55, !), FC-II (16, !), FC-III (31, !), TC (73, !); C
- var. *flavescens* Custer: WC-III, FC-III (23); Hh, Cosm; *Phragmition*
320. *Poa palustris* L.: WC-II-III (1, 43, 70, !), BC-II-III (!), FC-I (11, 50, 53), DC (70); C
- f. *depauperata* (Kit.) A. et G.: WC-III, BC-III (70); H, Cp (bor); *Calthion*, *Magnocaricion*, *Alnion*, *Phragmition*

ARACEAE

321. *Acorus calamus* L.: WC-III (23, 70); Hh (G), Adv; *Phragmitetalia*; Ex?

LEMNACEAE

322. *Lemna gibba* L.: WC-II-III (1, 23, 70), FC-III (60), TC (!); Hh, Cosm; *Lemnion*; R

323. *L. minor* L.: WC-I (!), WC-II-III (1, 44, !), BC-II-III (14, 34, 39, !), FC-I (11, !), FC-II (30, !), FC-III (14, !), DC, TC (14, !); Hh, Cosm; Lemnion; C
 324. *L. trisulca* L.: WC-II (44), WC-III (70), BC-III (!), FC-III (18, 31, 60, 70); Hh, Cosm; Lemnion; rC
 325. *Spirodela polyrrhiza* (L.) Schlch.: WC-III (66, 70, !), BC-III (!), FC-III (18, 31, 60, 70, !), DC, TC (!); Hh, Cosm; Lemnion; C
 326. *Wolffia arrhiza* (L.) Horkel: BC-III (39); Hh, Atl-M; Lemnion; E

SPARGANIACEAE

327. *Sparganium erectum* L.: C
 ssp. *erectum*: WC-III (1, 70), BC-II (14, !), FC-I (11), FC-II (30), DC, TC (14);
 var. *angustifolium* Warnst.: BC-II (34);
 ssp. *neglectum* (Beeby) Sch. et Thell.: FC-I (55), FC-III (23, 31); Hh, Eua; Glycerio-Sparganion, Phragmiton
 328. *S. emersum* Rehmman (S. *simplex* Huds.): WC-III (!); Hh, Eua; Phragmiton; R
 329. *S. minimum* Hill.: FC-I (23, 37, 38); Hh, Cp (bor); Potamion-Magnocaricion; Ex?

TYPHACEAE

330. *Typha angustifolia* L.: WC-II-III (1, !), BC-II-III (34, 39, !), FC-I (11, 55, !), FC-II-III (!), TC (70); Hh, Cosm; Phragmiton; C
 331. *T. latifolia* L.: WC-I-II-III (1, !), BC-I-II-III (34, !), FC-I-II (11, 55, !), FC-III (18, 31), DC (!), TC (8); Hh, Cosm; Phragmiton; C

CYPERACEAE

332. *Acorellus pannonicus* (Jacq.) Palla: WC-III (23); Th, Eua (C); Cypero-Sparganion; V
 333. *Blysmus compressus* (L.) Panz.: FC-III (23); G, Eua; Agropyro-Rumicion, Molinio-Juncetia; R
 334. *Bolboschoenus maritimus* (L.) Palla: WC-III (1, 8), BC-III (!), DC, TC (8); Hh, Cosm; Bolboschoenion; rC
 335. *Carex acutiformis* Ehrh.: WC-I-II (1, 44, !), WC-III (70), BC-II (!), FC-I-II (11, 16, 30, 50), FC-III (70); Hh, Eua (M); Magnocaricion, Caricion *gracilis*; C
 336. *C. appropinquata* Schumacher: FC-I (23), FC-II (16); Hh, Eua; Magnocaricion, Caricion *rostratae*; Ex?
 337. *C. buekii* Wimm.: FC-III (23, 60); Hh, P-Pn; Magnocaricion, Caricion *rostratae*, Glycerio-Sparganion; R
 338. *C. buxbaumii* Wahlenb.: FC-I (23, 37, 38), FC-II (30); G, Cosm; Magnocaricion, Caricion *rostratae*, Molinieta; rC
 339. *C. canescens* L.: FC-I (10, 23, 37, 38, 50, 55); H, Cp (bor); Caricion *canescenti-nigrae*; rC
 340. *C. distans* L.: WC-I-II (1, !), BC-I (40, !), FC-I (11, 55); H, E; Agrostion *stoloniferae*, Eriophorion *latifolii*, Molinion; rC
 341. *C. divisa* Huds.: WC-III (!); G, Eua; Molinieta, Juncion *gerardi*; rC
 342. *C. elata* All.: FC-II (30, !); Hh, E; Magnocaricion, Caricion *rostratae*; rC
 343. *C. elongata* L.: FC-I (23, 57); H, Eua (bor); Alnion *glutinosae*; rC
 344. *C. flacca* Schreber: WC-II (1); G, Eua; Magnocaricion, Molinieta; rC
 345. *C. flava* L.: WC-I-II (1, !), BC-I-II (35, 36, 40, 41, !), FC-I (10, 50, 54, 55), FC-II (16); H, Cp (bor); Caricetalia *davallianae*, Calthion, Eriophorion *latifolii*; C
 346. *C. gracilis* Curt.: WC-II-III (1, !), BC-I-II (!), FC-I (23, 54), FC-II (16, 30), FC-III (23), TC (!); C
 var. *sphaerocarpa* (Uechtr.) Kükenth.: TC (70);
 var. *serotina*: DC (70); Hh-G, Eua; Caricion *gracilis*, Alno-Padion, Magnocaricion, Calthion
 347. *C. hirta* L.: WC-II (!), BC-I-II (35, 40, 41, !), FC-I-II (11, 30, 55), FC-III (27); C

- var. *hirtiformis* Pers.: DC (70); G, E (M); Magnocaricion, Agropyro-Rumicion
348. *C. lasiocarpa* Ehrh.: FC-I (55); Hh, Cp (bor); Caricion *lasiocarpae*; Ex?
349. *C. lepidocarpa* Tausch: WC-I (1), BC-I (40, 41, !), FC-I (11, 23, 37, 54, 55, 57); H, E; Eriophorion *latifolii*, Montio-Cardaminetia; C
350. *C. leporina* L.: WC-I-II (1, !), BC-I-II (35, 40, 41, !), FC-I-II (10, 30, 37, 49, 50, 55, !); C
f. *robusta* (Fiek) Borza: FC-I (23);
f. *argyroglochin* (Hornem.) Kükenth.: FC-I (10, 23);
f. *capitata* (Sonder) Kükenth.: FC-I (10, 23); H, Eua (bor); Molinio-Juncetia, Caricion *canescenti-nigrae*
351. *C. limosa* L.: FC-I (23, 37, 38, 50, 55); H, Cp (bor); Rhynchosporion; R
352. *C. magellanica* Lam.: FC-I (10, 23, 37, 38, 50), BC-I (23); H, Cp; Scheuchzeria-Caricetia *nigrae*; V
353. *C. melanostachya* Bieb.: WC-II (1), FC-I (57), FC-III (60), TC (73); Hh, Eua (C); Magnocaricion, Caricion *gracilis*, Agrostion; rC
354. *C. nigra* (L.) Reichard. (*C. fusca* All.): WC-II (1), FC-I (37, 55), FC-II (30, !); G, Cp (bor); Caricetalia *nigrae*; C
355. *C. paniculata* L.: FC-I-II (11, 16, 23, 37); Hh, Ec; Magnocaricion, Caricion *rostratae*; rC
356. *C. pauciflora* Lightf.: FC-I (10, 23, 37, 38, 50); H, Cp (bor); Oxycocco-Sphagnetia; E
357. *C. pendula* Host.: WC-I (1); H, Atl-M; Alno-Padion; R
358. *C. pseudocyperus* L.: WC-III (1, 23); Hh, Cp (bor); Magnocaricion, Caricion *rostratae*; rC
359. *C. remota* Grufb.: WC-II (1), BC-I-II (35, !), BC-III (Herb. I. Pop), FC-I (10, 11, 50, 55), DC (70); H, E; Alno-Padion; rC
360. *C. riparia* Curt.: WC-II (1, 63), BC-II-III (39, !), DC (70), TC (8, 70); Hh, Eua (M); Magnocaricion, Caricion *gracilis*; C
361. *C. rostrata* Stokes: FC-I (10, 23, 50, 55, 57); Hh, Cp (bor); Caricion *rostratae*, Magnocaricion; rC
362. *C. stellulata* Good. (*C. echinata* Murray): WC-I-II (1, 23, !), BC-I-II (35, 40, 41, !), FC-I (10, 23, 37, 50, 54, 55), FC-II (16, 30); C
- var. *grypos* (Schkuhr) Koch: FC-I (60); H, Cp (bor); Caricion *canescenti-nigrae*, Calthion, Magnocaricion
363. *C. vesicaria* L.: WC-II (1), FC-I-II (10, 30, 37, 50, 55, !), FC-III (23, 60); Hh, Cp (bor); Magnocaricion, Caricion *gracilis*; C
364. *C. vulpina* L.: WC-II-III (1, !), BC-I-II (!), FC-I (11, 49, 50, 55), FC-III (27); Hh-H, Eua (M); Magnocaricion, Caricion *gracilis*, Agropyro-Rumicion, Phragmition; C
365. *C. x biharica* Simk. (*canescens x stellulata*): FC-I (23, 37, 38)
366. *C. x pannewitziana* Figert (*rostrata x vesicaria*): FC-I (10)
367. *C. x toezensis* Simk. (*melanostachya x riparia*): WC-III (23)
368. *Chlorocyperus glomeratus* (L.) Palla: WC-II (1, 44), WC-III (70); Hh, Eua (M); Cyperion *glomerati*, Nanocyperion; rC
369. *Cyperus difformis* Torn.: FC-III (14, 23), DC, TC, (14); Th, Adv, Oryzion; C
370. *C. fuscus* L.: WC-I (!), WC-III (70, !), FC-III (23), DC, TC (14); C
var. *virescens* (Hoffm.) Vahl.: WC-III (1, 23, 70); Th, Eua (M); Cyperetalia *fusci*
371. *Eleocharis acicularis* (L.) R. Br.: WC-III (1, 23, 70, !), FC-I (57), FC-III (23); Th, Cp (bor); Nanocyperion; rC
372. *E. carniolica* Koch: WC-II (1, 23), BC-I-II (23, 35), FC-I (23, 37, 38, 55), FC-III (23, 60); Th, Alp-Carp-B; Nanocyperion; rC
373. *E. ovata* (Roth) Roem. et Schulz: WC-II (1, 23), BC-I-II (23, !), FC-I (55), FC-III (23, 60); Th, Cp (bor); Nanocyperion; rC
374. *E. palustris* (L.) R. Br.: WC-I-II-III (1, !), BC-I-II (35, !), FC-I (11, 50, 55), FC-II (16, 30), FC-III (!); G-Hh, Cosm; Phragmitetia, Nanocyperetalia; C

375. *Eriophorum angustifolium* Honck.: WC-I (1), FC-I (10, 37, 52, 55); G, Cp (bor); Molinio-Juncetea, Scheuchzerio-Caricetea nigrae; C
376. *E. latifolium* Hoppe: WC-I-II (1), BC-I (40, 41, !), FC-I (10, 11, 37, 50, 54, 55, !), FC-II (16); H, Eua; *Eriophorion latifolii*, *Caricetalia davallianae*; C
377. *E. gracile* Koch: FC-I (23, 55); G, Cp (bor); *Caricion lasiocarpae*, *Caricion canescenti-nigrae*; R
378. *E. vaginatum* L.: WC-I (1), FC-I (10, 37, 38, 50); H, Cp (bor); *Sphagnion fuscii*; V
379. *Pycnus flavescens* (L.) Rchb.: WC-II-III (1, 23, 70, !), BC-II (35, !), FC-III (23); Th, Cosm; *Nanocyperion*; C
380. *Rhynchospora alba* (L.) Vahl.: FC-I (23, 37, 38); H, Eua; *Rhynchosporion*; Ex?
381. *Schoenoplectus lacustris* (L.) Palla: WC-I (!), WC-II-III (1), BC-II (!), BC-III, TC (8); Hh-H, Cosm; *Phragmition*; C
382. *S. tabernaemontani* (Gmel.) Palla: BC-III (14); Hh, Eua; *Phragmition*; rC
383. *S. michelianus* L. (*Dichostylis michelianus* (L.) Nees): TC (8, 73); Th, Eua (M); *Nanocyperion*; E
384. *S. mucronatus* (L.) Palla: WC-III (1, 23), BC-III (!); Hh, Adv; *Nanocyperion*, *Phragmitetea*; rC
385. *S. supinus* L. (*Isolepis supina* (L.) R. Br.): WC-III (70), TC (8, 70); Th (Hh), Cosm; *Nanocyperion*; rC
386. *Scirpus sylvaticus* L.: WC-I-II (1, 23, !), BC-I-II (35, !), FC-I-II (10, 11, 16, 23, 49, 50, 54, 55, !), FC-III (23); Hh-G, Cp (bor); *Phragmitetea*, *Calthion*, *Alno-Padion*; C
387. *Cladium mariscus* (L.) Pohl.: FC-I (23); Hh, Cosm; *Caricion rostratae*, *Magnocaricion*; Ex?

ORCHIDACEAE

388. *Epipactis palustris* (L.) Cr.: WC-I-II (1, 23, 63, 44, !), BC-I (40, !); G, Eua; *Caricetalia davallianae*, *Molinion*; C
389. *Orchis incarnata* L.: WC-I (1), FC-I (23, 37, 55); G, Eua (M); *Calthion*, *Molinion*; rC
390. *O. laxiflora* Lam.; rC
- ssp. *elegans* (Heuff.) Soó (*O. palustris* auct.): WC-II (1), FC-I (10, 50, 52), FC-III (60); G, Eua (M); *Magnocaricion*, *Molinieta*

The conspect of the vegetal associations

LEMNETEA W. Koch et Tx. 1954

LEMNETALIA W. Koch et Tx. 1954

Lemnion minoris W Koch et Tx. 1954

1. Lemnetum minoris (Oberd. 1957) Müller et Görs 1960: WC-II (1,!), WC-III (!), BC-III (19, 39), FC-III, DC, TC (!),

2. *Salvinio-Spirodeletum polyrrhizae* Slavnic 1956: WC-III (!), BC-III (19), DC, TC (!); *najadetosum* I.Pop 1968: BC-III (!)

Utricularion vulgaris Pass. 1964

3. Lemno-Utricularietum Soó 1928: BC-III (19), FC-II (30), TC (73, !)

HYDROCHARIETALIA Rübel 1933

Hydrocharition Rübel 1933

4. *Ceratophylleto-Hydrocharetum* I. Pop 1962: BC-III (19, 39), TC (!)

Potametea Tx. et Prsg. 1942

POTAMETALIA W. Koch 1926

Ranunculion aquatilis Pass. 1964

5. *Ranunculetum aquatilis* Géhn. 1961: WC-II (44)

6. *Callitrichetum cophocarpae-palustris* (O. Rațiu 1966) Drg. 1989: WC-III (!), FC-I (11, 52)
7. *Ranunculo trichophyllo-Callitrichetum cophocarpae* Soó (1927) 1960: FC-II (30)
8. *Potametum ndodosi* Soó (1928) 1960: TC (!)
Potamion subal. Magnopotamion (Vollmar 1947) Den Hartog et Segal 1964
9. *Potameto-Ceratophylletum* I. Pop 1962: WC-III (!), BC-III (19), FC-III, DC, TC (!)
10. *Myriophyllo-Potametum* Soó 1934: WC-III (1, !), BC-II-III (19, !), TC (73, !);
polygonetosum amphibii: TC (73);
potametosum lucentis: TC (73);
potametosum crispi: TC (73)
11. *Potametum crispi* Soó 1927: BC-III (19), FC-I (11, 55)
Potamion subal. Parvopotamion (Vollmar 1947) Den Hartog et Segal 1964
12. *Najadi-Ceratophylletum* I. Pop 1962: BC-III (19), DC, TC (!)
Nymphaeion Oberd. 1957 emend. Neuhausl 1959
13. *Nymphaeetum albo-luteae* Nowinski 1928
nupharetosum Soó (1957) 1964: BC-III (!);
nymphaetosum V. Kárpáti 1963: TC (73)
14. *Nymphaeetum loti-thermalis* Borza (1931) 1963: FC-III (58, !)
15. *Polygonetum natantis* Soó 1927: WC-II (1), WC-III (!), BC-III (19)
16. *Potametum natantis* Soó 1927, Eggler 1933: WC-III (!), BC-II-III (19, !), FC-I (11)
17. *Trapetum natantis* Müller et Görs 1960: BC-III (19), DC (!), TC (73)
Phragmitetea Tx. et Prsg. 1942
PHRAGMITETALIA W. Koch 1926 emend. Pign. 1953
Phragmition communis W. Koch 1926 emend. Soó 1947
18. *Scirpo-Phragmitetum* W. Koch 1926: WC-II (1, 44, !), WC-III (!), BC-II-III (19), FC-II (16),
FC-III, DC, TC (!);
sparganietosum: TC (73)
19. *Typhaetum angustifoliae* (All. 1922) Pign. 1943: WC-II-III (!), BC-II-III (19), FC-I (55)
20. *Typhaetum latifoliae* Soó 1927: WC-II-III (!), BC-II-III (19), FC-I (55), FC-III (!)
21. *Schoenoplectetum lacustris* Eggler 1933: WC-I (!)
22. *Glycerietum maximae* Hueck 1931: WC-II (1), WC-III (!), BC-II-III (19, !), FC-II (16);
siosum latifolii Csűrös et all. 1969: FC-II (16)
Bolboschoenion maritimi Soó 1947
23. *Bolboschoenetum maritimi* Soó (1927) 1957: FC-III, DC (!)
NASTURTIO-GLYCERIETALIA Pign. 1953
Glycerio-Sparganion Br.-Bl. et Sising ex Boer 1942
24. *Glycerio-Sparganietum neglecti* W. Koch 1926: WC-II (44)
25. *Equiseto-telmateii-Glycerietum nemoralis* Szabo A. 1971: WC-I (!)
26. *Glycerietum plicatae* Oberd. (1952) 1957: WC-I (!), FC-I (11, 52, 55), FC-II (30);
cardaminetosum amarae O. Rațiu et Sălăg. 1971: FC-I (52);
caricetosum stellulatae O. Rațiu 1965: FC-I (50)
27. *Alismato-Eleocharidetum* Máthé et Kovács 1967: WC-II (1, !), WC-III (!)
MAGNOCARICETALIA Pign. 1953
Magnocaricion elatae W. Koch 1926
subal. Caricion rostratae (Bálátová -Tulácková 1963) Oberd. 1967
28. *Caricetum elatae* W. Koch 1926: FC-II (30);
sphagnetosum platyphylli Pócs 1958: FC-II (30);
menyantho-comaretosum Simon 1960: FC-II (30)
29. *Caricetum rostratae* Rübel 1912: FC-I (57)
30. *Caricetum paniculatae* Wangerin 1916, Soó 1969: FC-I (57)
31. *Caricetum appropinquate* (W. Koch 1926) Tx. 1947: FC-II (16)

subal. *Caricion gracilis* (Neuhausl; 1959, Bálátová - Tulácková 1963) Oberd. 1967

32. *Caricetum gracili* Almquist 1929, Tx. 1937: WC-II (1, !), WC-III (!), BC-II (19), FC-II (16,!);
phragmitosum fac. Nov.: BC-II (!)

33. *Caricetum acutiformis-ripariae* Soó (1927) 1930: BC-II-III (19);
caricetosum melanostachyae Soó 1957: TC (73)

34. *Caricetum vesicariae* Br.-Bl. et Denis 1926, Zólyomi 1931: WC-II (44), FC-I (54)

35. *Caricetum vulpinae* Soó 1927: WC-II (1)
Isoeto-Nanojuncetea Br.-Bl. et Tx. 1943
NANOCYPERETALIA Klika 1935
Nanocyperion flavescens W. Koch 1926

36. *Pycreo-Juncetum* Soó et Csűrös 1944: WC-I (!), WC-II (17), BC-II (35, !), FC-I (57)

37. *Juncetum bufonii* Morariu 1956, Philippi 1968: BC-II (19)

38. *Dichostyli-Gnaphalietum uliginosi* (Horvatic 1931) Soó et Timar 1947: TC (73)
Verbenion supinae Slavnic 1951

39. *Pulicario vulgaris* - *Menthethum pulegii* Slavnic 1951: WC-II-III (!), BC-II-III (19), FC-III(!)
Montio-Cardaminetea Br.-Bl. et Tx. 1943
MONTIO-CARDAMINETALIA Pawl. 1928
Cardamini-Montion Br.-Bl. 1925

40. *Cardaminetum amarae* (Rübel 1912) Br.-Bl. 1926 s. str.: FC-I (52, 55); *stellarietosum alsinis* (Harg. 1942) Soó 1964: FC-I (54, 55)
Scheuchzerio-Caricetea nigrae Nordh. 1936
SCHEUCHZERIO-CARICETALIA NIGRAE (W. Koch 1926) Görs et Müller 1967
Rhynchosporion albae W. Koch 1926

41. *Caricetum limosae* Br.-Bl. 1921: FC-I (55)
Caricion lasiocarpae Van den Bergen 1949

42. *Caricetum lasiocarpae* W. Koch 1926: FC-I (55)
Caricion canescenti-nigrae (W. Koch 1926) Nordh. 1936

43. *Carici stellulatae-Sphagnetum* Soó (1934) 1954: FC-I (54, 55), FC-II (30) *nardetosum strictae* Lupşa 1971: FC-I (58)

44. *Carici rostratae-Sphagnetum* Zólyomi 1931: FC-I (55, 58);
pediculariosum limnogenae (Raţiu 1965) comb. Nov.: FC-I (50)

45. *Caricetum nigrae* Br.-Bl. 1915: FC-I (57), FC-II (30)

46. *Carici-Menyanthetum* Soó (1938) 1955: FC-I (55)
Tofieldietalia Prsg. Apud Oberd. 1949
Eriophorion latifolii Br.-Bl. et Tx. 1943

47. *Caricetum appropinquatae-stellulatae* Soó (1954) 1957: FC-II (16)

48. *Carici flavae-Eriophoretum* Soó 1944: WC-I (1, !), BC-I (19, 35, 40, 41), FC-I (55), FC-II (16)

49. *Valeriano-Caricetum flavae* Pawl., Pawlowska et Zarzucki (1943) 1960: FC-I (58)
Oxycocco-Sphagnetetea Br.-Bl. et Tx. 1943
SPHAGNETALIA Pawl. 1928
Sphagnion fusci Br.-Bl. 1920

50. *Sphagnetum medii* Kastn., Flossn. et Uhl. 1933: FC-I (38);
caricetosum pauciflorae Raţiu et Moldovan 1972: FC-I (38)

51. *Eriophoro vaginato-Sphagnetum recurvi* Hueck 1925: FC-I (38, 50, 58);
betuletosum pubescentis (Zólyomi 1931) Soó 1964: FC-I (38, 58);
caricetosum rostratae Lupşa 1971: FC-I (38, 58)
Molinio-Arrhenatheretea Tx. 1937
MOLINIETALIA W. Koch 1926

Agrostion stoloniferae Soó (1933) 1971
 52. Junceto-Agrostietum Resmerița 1970: WC-II-III (!), BC-II (58)
 53. Agrostietum stoloniferae (Újvárosi 1941) Burduja et all. 1956: WC-II-III (1, !), BC-II-III (19), FC-II (16), FC-III (!), DC (!), TC (73)
 54. Agrostietum caninae Harg. 1942: FC-I (55)
 55. Ranunculeto strigulosi-Equisetum palustris Gh. Popescu 1975: WC-I (!)
 Molinion coeruleae W. Koch 1926
 56. Junco-Molinietum coeruleae Prsg. 1951: FC-I (55)
 57. Nardo-Molinietum coeruleae Gergely 1958: FC-I (55)
 Calthion palustris Tx. 1937
 58. Calthaetum laetae V. Krajina 1933: FC-I (50, 55, 56, 57);
 pediculariosum limnogenae E. Pop 1960: FC-I (38)
 59. Scirpetum sylvatici Schwick. 1944: WC-I-II (1, !), BC-I (!), FC-I (51, 52, 54, 55)
 60. Epilobio palustri-Juncetum effusi Oberd. 1957: FC-I (54), FC-II (58)
 61. Valeriano-Calthaetum laetae Lupșa 1971: FC-I (58)
 Filipendulo-Petasition Br.-Bl. 1947
 62. Petasitetum hybridi (Dost. 1933) Soó 1940: WC-I-II (1, !), BC-I (19, 40), BC-II (19, 35), FC-I (11, 50, 52, 54)
 63. Filipendulo-Geranium palustris W. Koch 1926: FC-I (52, 58)
 DESCHAMPSIETALIA CAESPITOSAE Horvatic 1956
 Alopecurion pratensis Soó 1938, Poss. 1946
 64. Alopecuretum pratensis Regel 1925, Nowinski 1928: WC-III (1), BC-II-III (19), FC-II (16), DC (!), TC (73)
 65. Festucetum pratensis Soó 1938: WC-II (1), BC-II-III (19), FC-III (27)
 Deschampsion caespitosae (Horvatic 1930) Soó 1971
 66. Agrostio-Deschampsietum caespitosae Újvárosi 1947: WC-II-III (!), BC-I-II (!)
 Puccinellio-Salicornetea Topa 1939
 PUCCINELLIETALIA Soó 1940
 Beckmannion eruciformis Soó 1933
 67. Agrostio-Beckmannietum (Rapaics 1916) Soó 1933: TC (73);
 ranunculetosum laterifolii: TC (73)
 Artemisietea Lohm., Prsg. et Tx. 1950
 CONVULVULETALIA SEPIUM Tx. 1950
 Calystegion sepium Tx. 1947 ex Oberd. 1949
 68. Cuscuta-Calystegietum Tx. 1947 em. Soó 1961: WC-III, BC-III, DC (!)
 69. Roripetum austriacae Oberd. 1957: WC-III, BC-III (!)
 70. Glycyrrhizetum echinatae (Soó 1940, Timár 1947) Slavnic 1951: WC-III (43), BC-III (19), DC (!)
 71. Polygonetum cuspidati Tx. et Raabe 1950: WC-I-II (!), BC-II-III (19)
 72. Helianthetum decapetali Morariu 1967 n.n.: WC-I-II-III (!), BC-II-III (19)
 73. Rudbeckio-Solidaginetum (Tx. et Raabe 1950) Soó 1961: WC-III (!), BC-II-III (19)
 74. Eupatorietum cannabini Tx. 1937: WC-I (!), BC-I-II (19, !)
 Bidentetea tripartiti Tx., Lohm. et Prsg. 1950
 BIDENTETALIA TRIPARTITI Br.-Bl. et Tx. 1943
 Bidention tripartiti (W. Koch 1926) Libbert 1932
 75. Polygono hydropiperi-Bidentetum tripartiti Lohm. 1950: WC-II (!), BC-II-III (19), FC-III, DC, TC (!)
 Chenopodion fluviatile Tx. 1960
 76. Echinochloo-Polygonetum lapathifolii (Újvárosi 1940) Soó et Csűrös (1944) 1947: WC-II (!), BC-II-III (19, !), FC-III (!), TC (73);

polygonetosum amphibii: TC (73)
 Plantaginetea majoris Tx. et Prsg. 1950
 PLANTAGINETALIA MAJORIS Tx. (1947) 1950
 Agropyro-Rumicion crispi Nordh. 1940
 77. Lolio-Potentilletum anserinae Knapp 1946: WC-II-III (!), BC-II-III (19), FC-III, DC, TC (!);
 juncetosum bufonii (Felföldy) Soó 1964: FC-I (54)
 78. Ranunculetum repentis Knapp 1946 emend. Oberd. 1957: WC-II (!), BC-II-III (19),
 FC-III(!)
 79. Juncetum effusi Soó (1931) 1949: WC-I-II (1, !), BC-I-II (19), FC-II (16)
 80. Junco-Menthetum longifoliae Lohm. 1953: WC-I-II (1, !), BC-II (!), FC-I (51), FC-II (!)
 Epilobietea angustifolii Tx. et Prsg. 1950
 PETASITETO-CHAEROPHYLLETALIA Morariu 1967
 Telekion Morariu 1967 n.n.
 81. Petasiteto-Telekietum speciosae Morariu 1967: WC-I (!), BC-I (19)
 Betulo-Adenostyletea Br.-Bl. 1948
 ADENOSTYLETALIA Br.-Bl. 1931
 Adenostylion alliariae Br.-Bl. 1925
 82. Petasito-Cicerbicetum Tx. 1937: FC-I (50, 58)
 83. Cardueto personatae-Heracleetum palmati Beldie 1967: FC-I (52, 56, 58)
 Deschampsion caespitosae Borza 1934
 84. Rumici-Deschampsietum caespitosae Csűrös et all. 1985: FC-I (51, 54)
 Salicetea purpureae Moor 1958
 SALICETALIA PURPUREAE Moor 1958
 Salicion albae (Soo 1930 n.n.) Müller et Görs 1958
 85. Salicetum albae-fragilis Issler 1926 em. Soó 1957: WC-II-III (1, 43, 44, !), BC-III (19),
 FC-II (16), FC-III, DC, TC (!);
 rubosum caesii: WC (73)
 Salicion triandrae Müller et Görs 1958
 86. Salicetum triandrae Malcuit 1929: WC-III (!), BC-III (19), FC-III, DC, TC (!); amorphosum
 fruticoasae Borza 1954 n.n.: WC-III, BC-III (!);
 salicetosum viminalis Soó 1958: BC-III (!);
 rubosum caesii Pázmány: BC-III (!);
 glycyrrhizosum echinatae: TC (73)
 87. Saponario-Salicetum purpureae (Br.-Bl. 1930) Tschou 1946: WC-I (1, !), BC-II-III (19, !).
 FC-I (11, 58), FC-II (16)
 ALNETEA GLUTINOSAE Br.-Bl. et Tx. 1943 em. Müller et Görs 1958
 SALICETALIA AURITAE Doing 1962 em. Westh. 1969
 Salicion cinereae Müller et Görs 1958
 88. Calamagrosti-Salicetum cinereae Soó et Zólyomi 1955: WC-II, BC-II (!)
 89. Alno-Salicetum cinereae (Kobendza 1930) Pass. 1956: FC-I (11, 58)
 Querco-Fagetea Br.-Bl. Et Vlieger 1937 em. Soó 1964
 FAGETALIA SILVATICAE (Pawl. 1928) Tx. et Diem. 1936
 Alno-Padion Knapp 1942 em. Medwecka-Kornas 1957
 subal. Ulmion Oberd. 1953
 90. Querco-Ulmetum Issler 1924: BC-III (19, 39), FC-III (42)
 subal. Alnion glutinosae-incanae (Br.-Bl. 1915) Oberd. 1953
 91. Alnetum incanae (Brockman 1907) Aichinger et Siegrist 1930: WC-I-II (1, !), BC-I (19),
 FC-I (54)
 92. Aegopodio-Alnetum glutinosae J. Kárpáti et Jurkó 1961: WC-II-III (1, 44, !), BC-I-II (19),
 FC-I (11, 58), FC-II (16)

Conclusions and Proposals

One of the conclusions concerning the aquatic vegetation of the Criș is that it is practically missing from the water of the rivers in their mountainous and hilly sectors due to the relatively powerful water stream and its low temperature, to the rocky substrate and to the oligotrophic character of the water. On the plain sectors the aquatic vegetation is better represented, the water of the rivers being more still and warmer, with a higher feeding capacity and having a sandy or cozy substrate. But we must specify that the most aquatic phytocenoses were not found in the water of the rivers, but in the channels and swamps or the ponds from the immediate proximity, the aquatic plants preferring mainly the still or very slowly flowing waters.

Among the aquatic vegetal associations *Nymphaetum loti-thermalis* is endemic and in a real danger of disappearance in the Crișul Repede Valley, in the thermal water of the Pețea rivulet near Oradea, needing urgent measures of effective protection. The cenoses of the association *Nymphaetum albo-luteae* are very rare and menaced by disappearance. Of course, the species which constitute these cenoses, *Nymphaea lotus* var. *thermalis*, *N. alba*, *Nuphar luteum*, are also in danger. There must be added to these a dozen other aquatic species in danger, such as *Marsilea quadrifolia*, *Ranunculus peltatus*, *R. circinatus*, *Aldrovanda vesiculosa*, *Hottonia palustris*, *Nymphoides peltata*, *Stratiotes aloides*, *Vallisneria spiralis*, *Potamogeton lucens*, *P. obtusifolius*, *P. trichoides*, *Wolffia arrhiza* a.o.

Among the paludal vegetal associations *Caricetum appropinquatae*, *Dichostili-Gnaphalietum uliginosi*, *Caricetum limosi*, *Caricetum lasiocarpae*, *Agrostio-Beckmannietum* are rare or with special phytogeographical and scientific significance. It is interesting that the hygro-mesophilous associations of adventive weeds like *Polygonetum cuspidati*, *Helianthetum decapetali*, *Rudbeckio-Solidaginetum* with well evolved and extended phytocenoses on the Crișul Alb and the Crișul Negru are absent on the Crișul Repede. About 40 from the paludal species are in danger of disappearance. Among these we mention the plants *Salix aurita*, *S. rosmarinifolia*, *Betula pubescens*, *Montia verna*, *Stellaria palustris*, *Myosurus minimus*, *Ranunculus lateriflorus*, *Trollius euripaeus*, *Elatine ambigua*, *E. hexandra*, *E. hungarica*, *Angelica archangelica*, *Andromeda polifolia*, *Blackstonia perfoliata*, *Swertia perennis*, *S. punctata*, *Limosella aquatica*, *Pedicularis limnogenae*, *Cirsium brachycephalum*, *Alisma gramineum*, *Sagittaria subulata*, *Scheuchzeria palustris*, *Acorus calamus*, *Acorellus pannonicus*, *Carex lasiocarpa*, *C. appropinquata*, *C. magellanica*, *C. pauciflora*, *Rhynchospora alba*, *Schoenoplectus michelianus*, *Cladium mariscus* a.o.

On the Criș, a series of natural reservations were created from government or regional decisions, for the protection of these species and phytocenoses among others. Thus, on the Crișul Alb there is the mixed reservation Dealul Pleșa Sebișului (782.1 ha) and the botanic reservations Dosul Laurului near Zâmbru (113.6 ha) and Bălțile near Gurahonț (2 ha). On the Crișul Negru more protected areas were constituted: the mixed reservations Cetățile Ponorului-Galbena Valley (491 ha), Sighiștel Valley (420.4 ha), Pietrele Boghii (289.2 ha), Groapa de la Barza and the botanic reservations Turbăriile (the Peat Bogs) Padiș (1 ha) and Fânațele (the Hay Fields) Crișului Pietros

(of the Rocky Criș). An important area of the Crișul Negru springs is a part of the Apuseni National Park. On the Crișul Negru are also situated the geological natural monuments of Izbul (the Spring) de la Călugări and Pietrele Galbenei. On the Crișul Repede there is the mixed reservation Defileul Crișului Repede (the Defile of the Crișul Repede) (219.7 ha), which includes the speological monument Peștera Vadu Crișului (the Ford of the Criș Cave); the botanic reservations Vârful (the Peak) Cărligata (10 ha), Iad Valley-Dealul Mare (2 ha), Vârful Boceasa (100 ha), Pădurea (the wood) Oșorhei (50 ha), Pârâul (the rivulet) Peșea near Oradea (10 ha) and the paleontological reservation Dealul (the hill) Șomleu (1 ha).

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