

The aquatic and paludal flora and vegetation from the River Someș/Szamos¹ Valleys

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Abstract

In this study we present the aquatic and paludal flora and vegetation of the Someșul Mare, Someșul Cald, Someșul Rece, Someșul Mic and „united“ Someș rivers. The Someș River's Basin was divided in seven sectors, respectively „A“, „B“, „C1“, „C2“, „D“, „E“ and „F“ sectors. After a short presentation of the botanical researches in this area, we present the aquatic and paludal flora, based on our own researches and on data from literature, too. A list of hydro- and hygrophytes is given, with the place of appearance of every species in the different sectors. After every species we listed in brackets the authors from references the data of whom we used or we put „(!)“ to denote our own data. This list contains a number of 352 species from 52 families, and subspecific taxons are also given. Besides the flora, The Someș Valleys' vegetation is also characterized. From the total of 200 vegetal associations, a number of 91 are aquatic or paludal ones.

Keywords: aquatic and paludal flora and vegetation, River Someș

Introduction

Before our investigations the botanic researches along the Someș/Szamos were unequally distributed and they were disproportionate, too. Thus, the Someșul Mic, Someșul Cald and Someșul Rece (respectively „D“, „C1“ and „C2“ sectors) were relatively well studied, from floristic and even phytocenological point of view. Someșul Mare („A“ and „B“ sectors) was investigated summarily from floristic point of view, and some phytocenological research was also done. As for the „united“ Someș („F“ and especially „E“ sectors) it was, practically uninvestigated, especially from phytocenological point of view.

Naturally, the first data from the Valley of Someș/Szamos were floristic and were given by J. Chr. G. Baumgarten (1816), later supplimented by F. Schur (1866) and M. Fuss (1866). They referred to the flora of Someșul Mic, and to a lesser degree, to that of Someșul Mare. The last was better analysed by Fl. Porcius (1878). F. Fodor (1909), I. Fintha (1994) and K. Karácsonyi (1995) made the most important contribution to the cognition of the flora of the inferior course of Someș/Szamos („F“ sector), while E. I.

¹ The first name is Romanian, and the second Hungarian

Nyárády (1941-1944), Z. Hargitai (1942, 1943) and R. Soó (1949) focused their attention on the course of Someșul Mic („D“ sector). A. Margittai (1933), I. Todor (1955) and I. Resmeriță (1970) published lists of plants from the courses of Someșul Cald and Someșul Rece (respectively „C1“ and „C2“ sectors). „Flora R.P.R.“ (1952-1976) synthesized all those data and supplemented them with new ones, increasing the number of plants known in the whole Valley of Someș/Szamos to almost 1200 species. As for the vegetation, the first phytocenological informations were provided by R. Soó (1927, 1947), and Șt. Csűrös (1944, 1947, 1970) about Someșul Mic, and by I. Prodan (1948) about Someșul Mic and Someșul Mare. This was supplemented with data belonging to the authors I. Pop and I. Hodișan (1962, 1981), I. Pop (1969, 1974), I. Hodișan and I. Pop (1970), I. Pop and colab. (1983, 1984, 1986), D. Mititelu and colab. (1988) and K. Karácsonyi (1995). For the superior course of Someșul Mare and for the united Someș, respectively „A“, „E“ and „F“ sectors, the phytocenological data are lacking or are just accidental and summary. In 1994 we published conspectus of the Someș vegetation which includes 190 associations.

Materials and methods

In order to provide a more correct and precise botanic characterization of the course of Someș/Szamos rivers, they were divided into seven sectors differing from one another not only floristic-phytocenologically, but also geomorphologically, pedologically, from a climatic point of view, in landscape degradation and in the level of water pollution. The seven sectors are noted by „A“, „B“, „C1“, „C2“, „D“, „E“ and „F“ (Figure 1.). In the list of the cormophytes, and the index of vegetal associations, after every item we have indicated the sector the respective item was found in.

The nomenclature of the phytotaxons and the phylogenetical system according to which the families were arranged, follow that of the „Flora R.P.R.“, vol. I-XIII. The bioforms and floristic elements are presented according to V. Sanda and colab. (1983) and R. Soó (1964-1980). In the following list, for each phytotaxon we have mentioned the sectors of the river where the plant grows (letters from „A“ to „E“), pointing out in brackets - by arabic numerals - the work which quote the plant. The bioform and the floristic element are also given. Our own data are indicated by the exclamation mark (!).

The nomenclature of the associations (as well as, to a great extent, their classification) were given on the basis of the following works: E. Oberdorfer (1970, 1977), V. Sanda and colab. (1980) and R. Soó (1964-1980). In the enumeration of the species we used the following abbreviations of the names of bioforms and floristic elements: Ph - phanerophyte (MPh - megaphanerophyte, mPh - mezophanerophyte, nPh - nanophanerophyte), Ch - chamaephyte, H - hemicryptophyte, G - geophyte, T - therophyte (Th - annual therophyte, TH - biannual therophyte), Hh - helohydathophyte; Cp - circumpolar, Eua - Eurasian, E - European, Ec - Central European, Atl-M - Atlantic - Mediterranean, M - Mediterranean, MP - Mediterranean-Pontic, P - Pontic, Pn - Pannonic, B - Balcanic, D - Dacic, Carp - Carpathic, Alp - Alpin, Bor - Boreal, C - continental, Cosm - cosmopolitan, Adv - adventive.

The exclamation mark (!) indicates our own data.

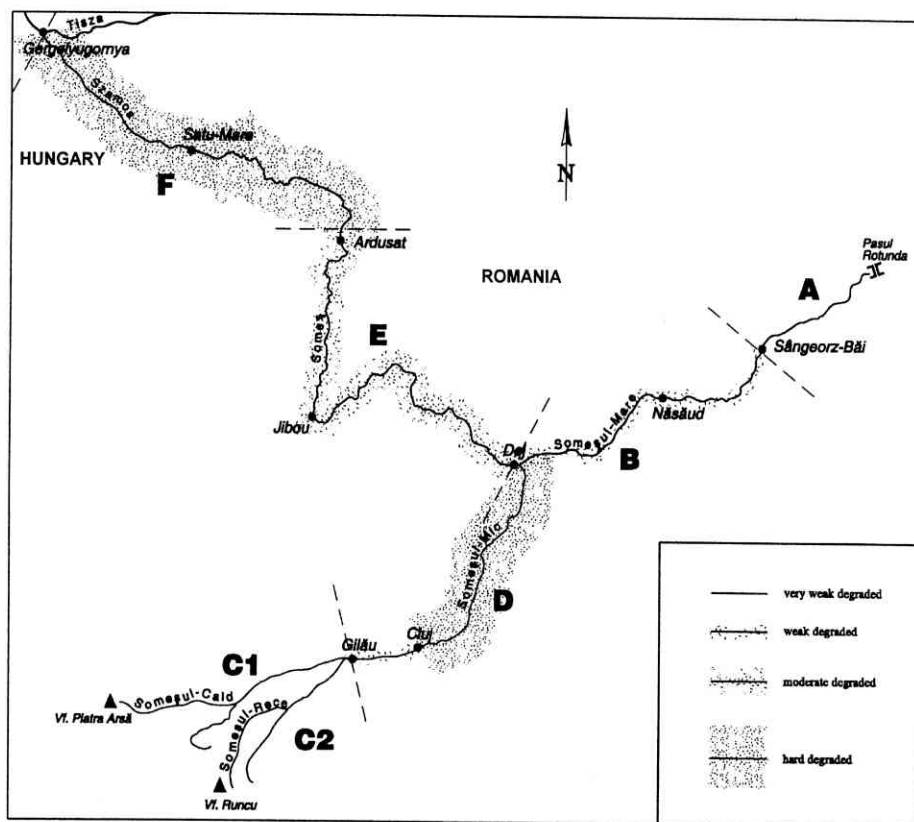


Figure 1. The sectors of the Someș rivers and the landscape degradation in Someș valleys

Results and discussion

Ecologic and floristic-phytocenologic characterization of the Valley of Someș/Szamos

In order to better characterize the Valley of Someș/Szamos from these points of view, we shall summarise each of the seven sectors of the river.

Sector „A“ is the superior course of Someșul Mare, between its springs and Săgeorț-Băi (Figure 1.). The vegetation is represented by woods of *Picea abies*, *Picea abies-Fagus* and *Fagus silvatica*, alternating, here and there with lawns of *Festuca rubra* and *Agrostis tenuis*. The characteristic plant associations, which occur only in this sector of the Someș are *Hypno-Polypodietum vulgaris* and *Petasito-Telekietum speciosae*. Among the species which occur only in this sector, we mention: *Salix eleagnos*, *Saxifraga stellaris*, *Polemonium coeruleum*, *Ligularia sibirica* and *Eriophorum gracile*.

The water of the river is little polluted, the landscape is almost unaltered, the woods are of a good vitality and the secondary natural lawns are dominant.

Sector „B“ is the segment of Someșul Mare between Sângeorz-Băi and Dej, where it confluent with Someșul Mic (Figure 1.). The vegetation is represented by typical water meadow associations, by woods of *Fagus sylvatica*, *Quercus petraea* and *Carpinus betulus*, here and there replaced by lawns of *Agrostis tenuis* and *Festuca rubra*. We note, among the associations which occur only in this sector: *Carici-Menyanthetum* and *Peplido-Limoselletum aquaticae*. Hygrophilous species present only in this sector are: *Cnidium dubium*, *Carex melanostachya*. Among the aquatic macrophytes we mention *Ranunculus peltatus* and *R. aquatilis*.

In this sector the water has a slightly higher level of pollution than in the previous one, mainly caused by domestic remains and animal dejections. The landscape is practically degraded, in the sense that almost 50% of the woods from the immediate proximity of the river were felled, their place being taken by secondary lawns and agricultural crops. This sector hosts the botanical reserve „Fânețele de la Mogoșeni-Florești“, on an area of 10 ha (D. Mititelu and colab., 1988).

Sector „C1“ is the course of Someșul Cald from its springs to Gilău (Figure 1.), that is to its confluence with Someșul Rece. The woods of *Picea abies*, *Picea abies-Fagus*, *Fagus-Carpinus* and *Quercus petraea-Carpinus* - here and there broken by lawns of *Festuca rubra*, *Agrostis tenuis* and *Nardus stricta* - are dominant. Species which occur only in this sector are *Salix pentandra*, *Swertia punctata*, *Juncus alpinus* and *Carex paniculata*.

Because of the altitude Someșul Cald is exposed to the anthropic pressure to a smaller extent. The woods have a medium vitality, and the landscape - which is generally agreeable - is more or less altered by the dams of three accumulation lakes. The river and the lakes are not very polluted. On the upper level, Someșul Cald runs through Cetatea Rădeșei and Cheile Someșului Cald, both of them very spectacular and home to many rare species.

Sector „C2“ encompasses the course of Someșul Rece from its springs to Gilău, where it confluent with Someșul Cald (Figure 1.). The woods and lawns are similar to those in the previous sector, but we must point out that here, on the upper course of the Someșul Rece, the peat bogs with their characteristic range of species occur on a large area. Among the plant associations which is to be found only in this sector we mention *Equisetetum fluviatilis*, *Carici stellulatae-Sphagnetum*, among the cormophyte species *Epilobium nutans*, *Rumex aquaticus*, *Drosera intermedia* and *Juncus filiformis*.

The landscape is sufficiently well preserved, but the woods (especially those of *Picea abies*) have a more reduced vitality than those of the „A“ and „C1“ sectors. The river contains clean water. In this sector what should be laid under protection, are the peat bogs situated upstream the chalet Blăjoaia, on the upper course of Someșul Rece and its affluents. E. Pop's (1947, 1960), I. Pop and colab.'s (1986, 1987) and our research has pointed out a series of rare species of plants and vegetal associations typical for the peat

bogs. Among these we mention: *Drosera rotundifolia*, *Drosera intermedia*, *Andromeda polypholia*, *Vaccinium oxycoccus*, *Empetrum nigrum*, *Carici rostratae-Sphagnetum*, *Eriophoro vaginato-Sphagnetum recurvi-magellanicum*.

Sector „D“ is the sector of Someșul Mic between Gilău and Dej where the confluence of Someșul Mic with Someșul Mare takes place (Figure 1.). Unlike the other sectors, the agricultural crops are predominant here. The mesophilous, meso-xerophilous and meso-hygrophilous lawns took the place of the broken up woods, remnants of which are still to be found, especially that of *Quercus petraea-Carpinus* and *Quercus petraea-Quercus robur*. Isolated groups of halophilous phytocenoses evolved too. From the vegetal associations distributed only in this sector we mention: *Ranunculo trichophyllii-Callitrichetum cophocarpae*, *Myriophyllo-Potametum*, *Potametum crispum*, *Parvopotameto-Zannichellietum*, *Ruppium rostellatae* and *Puccinellietum limosae*. It is this sector of the river where the *Myriophyllum spicatum* and *Potamogeton crispus* species appear.

Apart from „F“, the „D“ sector is the most degraded segment of the Someș. The woody vegetation (including the meadow one) is mostly destroyed, and the river has an extraordinarily high degree of pollution (mainly due to the industry of Cluj). Particular attention must be paid to the preservation of the remaining woods. Of areas which should be protected we mention the salt marshes from Ocna-Dej.

Sector „E“ includes the course of the united Someș between Dej and Ardușat (Figure 1.). In this sector a greater wood-covered area could be observed than in the previous one. The meadow riverside coppices in this region are, too, altered by the felling of the trees of *Salix alba* and *Populus alba*. The largest portion of sector E belongs to the agricultural crops and the lawns of *Agrostis stolonifera*, *A. tenuis*, *Festuca rubra* and *Arrhenatherum elatius*. Not many specific vegetal associations and plants are listed because the sector was less studied. However we mention the: *Bolboxshcoenetum maritimi*, *Glycerietum plicatae*, *Polygonetum cuspidati*.

The landscape is moderately degraded, especially because of the substitution of large woody areas by agricultural crops, and the water of the river is intensely polluted. We suggest that the meso-hygrophilous vegetation between Benesat and Ardușat be laid under protection.

Sector „F“ is the lowland course of the Someș, between Ardușat and its confluence with Tisza (Figure 1.). As a consequence of the anthropization of the landscape, the absence of woods may be noticed. The agricultural crops, the meso-xerophilous lawns and the riverside coppices of *Salix-Populus* are predominant. Among the associations noticed only in this sector we mention *Bidentetum cernui*. Among the cormophytes, the *Ranunculus lateriflorus*, *Elatine triandra*, *E. alsinastrium*, *Trapa natans*.

This sector is intensely degraded, the vegetation being mostly artificial or anthropized. The water is also intensely polluted by the polluting agents from the towns situated in the pervious sectors joining those from the cities Baia Mare and Satu Mare.

The hydrophilous and hygrophilous flora

The Someş is characterized by a rich flora, incorporating 2412 phytotaxons, consisting of 1700 species, 90 subspecies, 336 varieties and 286 forms. A total of 352 species are hydro- or hygrophilous, and they belong to 59 families (Table 1.). The most abundantly represented families are the CYPERACEAE (54 species), ASTERACEAE (31 species), POACEAE (26 species), SALICACEAE (23 species), RANUNCULACEAE (16 species), POLYGONACEAE (14 species), APIACEAE (14 species), LAMIACEAE (12 species), JUNCACEAE (11 species), and ONAGRACEAE (10 species).

LYCOPODIACEAE

1. *Lycopodium inundatum* L.: C2 (44); Ch; Cp

EQUISETACEAE

2. *Equisetum telmateja* Ehrh.: A (16), B (23,49,!), C1 (37), D (16,61,!); G; Cp

- var. *legitimum*: F. Wirtig B, D (16)

- f. *frondescens* (A.Br.) Aschers.: B (16)

- var. *minus* J. Lange: B, D (16)

- var. *densum* F. Wirtig: B (16)

- var. *conforme* (Schm. et Rgl.) F. Wirtig: B, D (16)

- f. *intermedium* (Luerss.) F. Wirtig: B (16)

- f. *monostachyum* (Milde) F. Wirtig: B, D (16)

- f. *polystachyum* (Schm. et Rgl.) F. Wirtig: B (16)

- f. *brevissimum* (Dorfl.) F. Wirtig: B (16)

3. *E. palustre* L.: A-F; G; Cp

- var. *simplicissimum*: A. Br. A (16)

- f. *arcuatum* Milde: A (16)

- f. *racemosum* Milde: A (16)

- f. *corymbosum* :A (16)

4. *E. fluviatile* L. em. Ehrh.: A (16), C1 (16, 37, 68), C2 (!), D (9), F (17, 26); Hh; Cp

5. *E. hyemale* L.: C1 (51, !); G; Cp

POLYPODIACEAE

6. *Matteuccia struthiopteris* (L.) Todaro: A (16, !), C1 (38, 41, !), C2 (16, 68, !), D (12, 16, 61); H; Cp

7. *Dryopteris thelipteris* (L.) A. Gray: A (16), B (29), D (16, 61); Hh; Cp

SALVINIACEAE

8. *Salvinia natans* (L.) All.: F (16, 17, 26, 62); Hh; Eua

MARSILEACEAE

9. *Marsilea quadrifolia* L.: F (17, 59); Hh; Eua (M)

BETULACEAE

10. *Alnus glutinosa* (L.) Gaertn.: B (5, 29, 61, !), C1 (41), C2 (68), D (12, 48, 64, !), E (!), F (18, 26); MPh-mPh; Eua

11. *A. incana* (L.) Mnch.: A (!), B (23, 29, !), C1 (41, !), C2 (6), D (12, 64); MPh-mPh; Eua

SALICACEAE

12. *Populus alba* L.: B (16, 49), D (16, 61), E (!), F (18, !); MPh-mPh; Eua
- var. *nivea* (Willd.) Handb.: E (!)
13. *P. nigra* L.: B (16, 23, 49, !), D (16, 48, 61), E (32), F (26, 32, !); MPh; Eua
14. *P. x canescens* Sm. (*alba x tremula*): D (64), F (!)
- f. *apahidensis* Nyár.: D (64)
15. *Salix fragilis* L.: B (23), C1 (36), C2 (6, 68), D (48, 64, !), E (32, !), F (!); MPh-mPh; Eua
- f. *latifolia* Anders.: C1 (36,37), C2 (68)
16. *S. triandra* L.: B (5), C1 (41), D (12, 32, 61, !), E, F (17, 32, !); mPh; Eua
17. *S. pentandra* L.: C1 (36); MPh; Eua
18. *S. alba* L.: B (23), D (48, 61, !), E, F (17,32, !); MPh-mPh; Eua
19. *S. purpurea* L.: A-F; mPh; Eua
- f. *eriantha* Wimm.: D (64)
- f. *parviflora* Pázm.: E (34)
20. *S. eleagnos* Scop.: A (16, !); mPh; Ec
21. *S. viminalis* L.: A, B (16, !), D (16, 32, 48, 64, !), E (32, !), F (17,18, 32, !); mPh; Eua
22. *S. cinerea* L.: B (29, 61, !), C1 (37, 68), D (49, 64), E, F (!); mPh; Eua
23. *S. aurita* L.: A (16), B (29), C1 (16, 36, 37); mPh; E
24. *S. rosmarinifolia* L.: B (16, 29, !), C1 (36, 37, 53), D (16, 61); mPh; Eua
25. *S. x alopecuroides* Tausch (*fragilis x triandra*): D (64)
- f. *latifolia*: Nyár. D (16)
26. *S. x rubens* Schrk. (*alba x fragilis*): C1 (68), D (49, 61, 64)
- var. *excelsior* (Host.) A. et G.: C1 (68)
- var. *palustris* (Host.) Seem.: C1 (68)
27. *S. x undulata* Ehrh. (*alba x triandra*): D (49)
- f. *erythroclados* (Simk.) Beldie: D (16)
28. *S. x leiophylla* A. et G. (*purpurea x triandra*): D (16)
29. *S. x multinervis* Döll (*aurita x cinerea*): B (16, 29), C1 (16, 37, 68)
30. *S. x parviflora* Host. (*purpurea x rosmarinifolia*): B, D (16)
31. *S. x subcinerea* Anders. (*silesiaca x cinerea*): C1 (37)
32. *S. x cuspidata* Schultz. (*fragilis x pentandra*): C1 (68)
33. *S. x trevirani* Spreng. (*triandra x viminalis*): D (49)
34. *S. x rubra* Huds. (*purpurea x viminalis*): D (49)

POLYGONACEAE

35. *Rumex hydrolapathum* Huds.: D (16); H (G); E
36. *R. aquaticus* L.: C2 (!); Hh; Cp
37. *R. stenophyllus* Ldb.: D (16, 42, 61), F (17); H; Eua
- var. *microvalvis* Bih.: D (16)
38. *R. maritimus* L.: B (16, 29), D (16, 61); Th; Eua
39. *R. palustris* Sm.: D (16, 42, 48, 49), F (26); Th-TH; Eua
40. *R. x stenophylloides* Simk. (*maritimus x stenophyllus*): D (16)

41. *Polygonum hydropiper* L.: A (16), B (16, 29, !), C2 (68), D (16, 48, !); Th; Eua
 - var. *acutifolium* A. Br.: B, D (16)
42. *P. mite* Schrank: A (16), B (16, 29), D (16, 39, 48, 61), E (32), F (26); Th; Eua
43. *P. minus* Huds.: A, B (16), D (16, 61), F (17); Th; Eua
44. *P. persicaria* L.: A (16), B (16, 29), D (16, 48, 61, !), E (!), F (17, 18, !); Th; Eua
 - ssp. *verum* Schuster: B (!), D (16)
 - var. *nodosum* (Pers.) Weinm.: B, D (16)
 - var. *tomentosum* (Schrank.) Beck: A (16), C1 (68), C2 (16, 68), D (16, 48, 63)
 - var. *normale* Schuster: B (16)
45. *P. amphibium* L.: B (!), D (42, !), F (18, 28); G-Hh; Cosm
 - f. *aquaticum* (Leyss) I. Grinț.: B (16), D (16, 48, 61), F (!)
 - f. *terrestre* (Leyss) I. Grinț.: B (16), D (16, 48), E, F (32)
46. *P. bistorta* L.: A (16, !), B (29, !), C1 (37, 68, !); H; Eua
47. *P. cuspidatum* Sieb. et Zucc.: B, C2 (!), D (16, !), E, F (!); Th; Adv
48. *P. x condensatum* F. Schultz. (*mite x persicaria*): D (16)
- PORTULACACEAE
49. *Montia fontana* L.: A, C2 (16); Th; Cp
- CARYOPHYLLACEAE
50. *Myosoton aquaticum* (L.) Mnch.: A (16, 54), B (16, 29, 49, 54), C2 (68), D (16, 61, !), E (32, !); Th-Th; Eua
51. *Stellaria alsine* Grimm: C1 (36, 51, 68), C2 (68, !); H; Cp
52. *S. palustris* Ehrh.: C2 (44, 68); H; Eua
53. *Lychnis flos-cuculi* L.: A-F; H; Eua
- EUPHORBIACEAE
54. *Euphorbia stricta* L.: C1 (50, 53), F (17, !); Th; E
55. *E. palustris* L.: D (49); H-Hh; E
56. *E. lucida* W. et K.: D (16, 61), F (17); H; E
- CALLITRICHACEAE
57. *Callitriche stagnalis* Scop.: C2, D (16); Hh; Eua
58. *C. cophocarpa* Sendtn.: B (16), D (16, 61, 62), F (17); Hh; Eua
59. *C. palustris* L. em. Druce: C1 (68), C2 (68, !), D (16, 61, 62), F (16, 17, 18, 26); Hh; Cp
- RANUNCULACEAE
60. *Trollius europaeus* L.: A (54), C1 (37, 50), C2 (16); H; E
61. *Caltha palustris* L.:
 - ssp. *palustris*: C1 (45), C2 (44), E (34); H; Cp
 - ssp. *cornuta* (Schott, Nyman et Kotschy): Hegi F (17, 18); H; Eua
 - ssp. *laeta* Schott, Nyman et Kotschy: A-F; H; E
 - var. *pseudocornuta* Zap.: D (16)
 - var. *alpina* (Schur) Graebn.: A (16, !), C2 (!), D (16)
62. *Myosurus minimus* L.: D (16), F (18, 26); Th; Cp
63. *Ranunculus peltatus* Schrank: B (16); Hh; E
64. *R. aquatilis* L.: B (16); Hh; Cosm

65. *R. trichophyllus* Chaix: A, B (16), D (16, 61), F (18); Hh; E
 - var. *pedicellatum* Glück: D (16)
 - var. *penicillatum* Glück: D (16)
 66. *R. rionii* Lagg.: C2, D (16); Hh; Eua
 67. *R. polyphyllus* W. et K.: F (16, 26); Hh-H; Eua
 68. *R. lingua* L.: D (16, 61), F (17); Hh; Eua
 69. *R. flammula* L.: A (16), B (16, 29, !), E (!), F (18); H; Eua
 70. *R. ophioglossifolius* Vill.: F (16); H; Atl-M
 71. *R. sceleratus* L.: B (16), D (16, 39, 42, !), E (!), F (18, !); Th; Cp
 72. *R. repens* L.: A-F; H; Eua
 - f. *prostratus* (Gaud.) Nyár.: C2 (68)
 - f. *degeneratus* (Schur) A. Nyár.: A (16)
 73. *R. lateriflorus* D.C.: F (18); Th; Eua
 74. *Thalictrum flavum* L.: B (16), F (18, 26); H; Eua
 75. *T. lucidum* L.: D (20, 61), F (17); H; Ec

NYMPHAEACEAE

76. *Nuphar lutea* (L.) Sm.: F (16, 17, 18, 26); Hh; Eua
 - var. *sericea* (Láng) Kitt.: F (17)

CERATOPHYLLACEAE

77. *Ceratophyllum demersum* L.: D (62); Hh; Cosm
 78. *Ceratophyllum submersum* L.: D (62); Hh; Eua

BRASSICACEAE

79. *Rorippa sylvestris* (L.) Bess.: A-F; H-G; E
 - ssp. *sylvestris* f. *pseudopalustris* (Schur) Nyár.: D (16)
 - f. *acutissima* Nyár.: D (16)
 - f. *densiflora* Borb.: F (16)
 - f. *dentata* (Koch) Borb.: A, D (16)
 - f. *rivularis* (Rchb.) Nyár.: D (16)
 - f. *tenuifolia* (Tsch.) Beck: A, D (16)
 - ssp. *kernerii* (Menyh.) Soó: B (29), D (16, 39), F (16, 26)
 80. *R. islandica* (Oed.) Borb.: B (16), C1 (51), D (16, 39, 61), F (17); Th-TH; Cosm
 81. *R. austriaca* (Cr.) Bess.: D (16, 39, 61, !), E (!), F (!18, !); H-G; Ec
 - var. *microcarpa* (Kitt.) Borb.: D (16)
 82. *R. amphibia* (L.) Bess.: D (16, 42, !), E (32), F (16, 17, 18); Hh; Eua
 - f. *aquatica* (L.) Fritsch: D (16)
 83. *R. x barbaraeoides* (Tsch.) Cel. (*islandica* x *sylvestris*): B (16), C2 (16, 68), D (16, 61)
 - var. *reichenbachii* Knaf: D (16), F (17)
 - f. *astylis* (Rchb.) Nyár.: D (16), F (17)
 - f. *macrostylis* (Tsch.) Nyár.: D (16)
 84. *R. x neogradensis* Borb. (*austriaca* x *islandica*) var. *dejensis* Nyár.: D (16)
 85. *R. x repens* Borb. (*amphibia* x *sylvestris*) var. *subglubosa* (Borb.) Nyár.: D (16)
 86. *Cardamine amara* L.:
 - ssp. *amara*: A (!), C1 (50, 68, !), C2 (22, 44, 68); H; Eua
 - ssp. *opizii* (Presl.) Cel.: A (!), C2 (68); H; Ec

87. *C. pratensis* L.:

- ssp. *pratensis*: A (16), C1 (50, 53, 68, !), C2 (22, 68), D (16); H; Cp

- ssp. *pratensis* var. *dentata* (Schult.) Neibr.: F (17)

- ssp. *matthioli* (Moretti) Soó var. *matthioli*: B (16), D (16, 61), F (18); H; Ec

DROSERACEAE

88. *Drosera rotundifolia* L.: A (16), C1 (36, 45, 53, 68), C2 (68, !); H; Cp

89. *D. intermedia* Hayne: C2 (37, 44); H; Cp

ELATINACEAE

90. *Elatine triandra* Schkuhr: F (17); Hh; Cp

91. *E. alsinastrum* L.: F (18, 26); Hh; Eua (M)

VIOLACEAE

92. *Viola biflora* L.: C1 (38, 51, 68, !), C2 (68); H; Cp

HYPERICACEAE

93. *Hypericum humifusum* L.: A (16); Th; Eua

94. *H. tetrapterum* Fries.: A (16), B (29), C1, C2 (6), D (16, 61); H; E

95. *H. x laschii* Fröhl (*tetrapterum* x *maculatum*): B (16)

SAXIFRAGACEAE

96. *Saxifraga stellaris* L.: A (!); Ch (H); Eua

97. *Chrysosplenium alternifolium* L.: C1 (41, 68, !), C2 (68), D (61, 63), F (17); H; Cp

98. *Parnassia palustris* L.: B (49), C1 (37, 68, !), C2 (!); H; Cp

ROSACEAE

99. *Potentilla palustris* (L.) Scop.: B (10, 29), C1 (37); Hh; Cp

100. *P. supina* L.: D (39, 63, !), F (17, !); Th-H; M

- f. *elator* (Lehm.): Th. Wolf D (48)

- var. *limosa* Boenn.: D (16, 48)

101. *P. anserina* L.: A-F; H; Cosm

102. *Geum rivale* L.: A (!), C1 (36, !), C2 (68, !); H; Cp

103. *Filipendula ulmaria* (L.) Maxim: A (!), C1 (36, 41, 51, !), C2 (44, !), D (61); H; Eua

- f. *denudata* (J.et C. Presl.) Beck.: A (16), C1, C2 (68)

FABACEAE

104. *Trifolium hybridum* L.: B (16), D (16, 42, !), E (!); H; E

105. *Lathyrus paluster* L.: C2, D (16); H; Cp

LYTHRACEAE

106. *Peplis portula* L.: B (29), C1 (36, 37), D (16), F (17); Th; Atl-M

107. *Lythrum hyssopifolia* L.: B (16, 29), D (16, 48), F (17, 18); Th; Cosm

108. *L. virgatum* L.: B (29, 49), D (16), F (17, 18); H-Hh; Eua

109. *L. salicaria* L.: A-F; H-Hh; Cosm

- var. *salicaria* f. *glabrescens* (Neilr.) Todor: C1, C2 (68)

- var. *tomentosum* D. C.: B (16)

ONAGRACEAE

110. *Epilobium hirsutum* L.: C1 (50, 68), C2 (68), D (16, 61, !), F (17, !); H (Hh); Eua

111. *E. adenocaulon* Hausskn.: A, D (16); H; Adv

112. *E. parviflorum* (Schreb.) Wither.: C2 (68), D (16, 48, 61), F (17); H; Eua

- f. *umbrosum* Hausskn.: A, D (16)

113. *E. roseum* (Schreb.) Pers.: B (16), C1 (!), C2 (68), D (16, 48, 61); H; Eua
 - f. *apricum* Hausskn.: D (16)
 - f. *umbrosum* Hausskn.: C1 (68)
114. *E. tetragonum* L.:
 - ssp. *tetragonum*: A (16), D (16, 61), F (17); H; Eua
 - ssp. *lamyi* (F. Schultz) Nym.: C2 (44), F (17); H; E
115. *E. palustre* L.: B (29), C1 (36, 37, 53, !), C2 (44), F (17); H; Cp
 - f. *longifolium* Hausskn.: A (16)
 - f. *major* Fires: A (16)
 - var. *fontanum* Hausskn.: A (16)
 - var. *pilosum* Hausskn.: A, B (16)
 - f. *subdenticulatum* K. Rubner: B (16)
116. *E. alsinifolium* Vill.: C1 (53); H; Eua
117. *E. obscurum* (Schreb.) Roth: A, B (16), D (16, 61), F (17); H; Atl-M
118. *E. nutans* Schmidt: C2 (!); H; E
119. *E. dodonaei* Vill.: A (16), D (16, 61); H; Ec
- TRAPACEAE
120. *Trapa natans* L.: F (16, 17, 26, !); Hh; Eua
 - var. *hungarica* (Opiz) Borb.: F (62)
- HALORAGACEAE
121. *Myriophyllum verticillatum* L.: D (16, 61, 62), F (17, 26, 62); Hh; Cp
122. *M. spicatum* L.: D (16, 61, 62), F (26); Hh; Cp
- HIPPURIDACEAE
123. *Hippuris vulgaris* L.: F (18); Hh; Cp
- GERANIACEAE
124. *Geranium palustre* Torner: A (16), B (29), C1 (36, 37, 68), C2 (68), D (48, 610); H; Eua
- APIACEAE
125. *Cicuta virosa* L.: B (29), F (18, 59); Hh; Eua
126. *Berula erecta* (Huds.) Coville: B (29), C2 (22); Hh; Cp
127. *Sium sisaroides* D. C.: D (16, 20, 61); Hh; Eua
128. *S. latifolium* L.: F (17); Hh; Eua
129. *Oenanthe aquatica* (L.) Poir.: B (29, 49), C2 (68), D (42, 61, !), F (17, 18); Hh; Eua
130. *O. silaifolia* M. B.: F (17, 180); H; M
131. *O. banatica* Heuff.: C1 (36, 37), C2 (16), D (16, 49), F (17); H; D-B-Pn
132. *Cnidium dubium* (Schkuhr) Thell.: B (29); TH (H); Eua
133. *Selinum carviflora* L.: B (29), E (!); H; Eua
134. *Angelica sylvestris* L.: B (29, 49, !), C1 (53, 68), C2 (68), D (61), E (!), F (17, !); H; Eua
 - var. *vulgaris* Frisch: C2 (16)
 - var. *elatior* Whlbg.: A (16), D (16, 20, 61)
135. *A. archangelica* L.: C1 (68, !), C2 (16, 68, !); TH-H; Eua
136. *Peucedanum palustre* (L.) Mnch.: B (16, 29), D (16), F (17); H; Eua
 - f. *angustifolium* (Rchb.) Thell.: B (16)
137. *P. latifolium* (M.B.) D.C.: D (10, 16, 61); H; P-B
138. *Heracleum palmatum* Baumg.: A (16), C1, C2 (!); H; End (Carp)

PRIMULACEAE

139. *Lysimachia nummularia* L.: A-F; Ch; E
- f. *parviflora* (Peterm.) Morariu: B, D (16)
140. *L. vulgaris* L.: C1 (36, 41, 68), C2 (68), D (39, 61, !), E (!), F (18); H-Hh; Eua
141. *Glaux maritima* L.: D (16, 49); H; Cp
142. *Hottonia palustris* L.: B (47, 62), E (16), F (17, 28); Hh; E

ERICACEAE

143. *Andromeda polifolia* L.: C1 (37, 45), C2 (16, 44, 68, !); Ch (nPh); Cp
144. *Vaccinium oxycoccos* L.: C1 (16, 36, 37), C2 (16, !); Ch; Cp
- ssp. *microcarpum* (Turcz.) M.N. Blytt.: C1 (16, 36, 45, 68), C2 (37, 44)
145. *Empetrum nigrum* L.: C1 (37, 45, 68), C2 (37, 44, 68, !); nPh; Cp

CONVOLVULACEAE

146. *Calystegia sepium* (L.) R. Br.: B (5, 49), D (16, !), E (!), F (16, !); H; Eua

POLEMONIACEAE

147. *Polemonium coeruleum* L.: A (16); H; Cp

BORAGINACEAE

148. *Myosotis scorpioides* L.: A-F; H-Hh; Eua
- var. *elatior* Opiz: A (!)
- var. *memor* Kitt.: F (16, 26)
149. *M. caespitosa* K. F. Schultz: A (16), D (61); Th-TH (H); Cp
150. *Symphytum officinale* L.: A (!), B (29, !), D (12, 39, 48, !), E (!), F (18); H; Eua
- ssp. *bohemicum* Schmidt: F (17)
- ssp. *uliginosum* (Kern.) Nym.: F (17)
- f. *inundatum* Menyhárt: D (16)

SCROPHULARIACEAE

151. *Scrophularia umbrosa* Dum.: C1 (41), D (49, 61), E (32), F (17); H; Eua
152. *Gratiola officinalis* L.: D (49), F (18); H; Eua
153. *Limosella aquatica* L.: B (29), D (16, 48, 49), F (17); Th; Cosm
154. *Veronica anagallis-aquatica* L.: B (29), C1, C2 (68), D (39, 48, 49), F (18); H-Hh; Cp
- f. *limosa* Krösche: D (16)
- f. *tenerrima* (Schm.) Vahl.: D (16, 61)
155. *V. anagallidioides* Guss.: F (17); H-Hh; Eua
156. *V. beccabunga* L.: B (29, !), C1 (36, !), C2 (22, !), D (39, 42, 48, 61), F (17, 59, !); Hh-H; Eua
157. *Pedicularis limnogenia* A. Kern.: C1 (16, 37, 45, !); H; Carp-B
158. *P. palustris* L.: D (61); H; Eua

LENTIBULARIACEAE

159. *Utricularia vulgaris* L.: C2 (16), D (16, 61), F (16, 26); Hh; Cp
160. *U. bremii* Heer: D (62); Hh; Ec
161. *U. australis* R. Br.: F (17); Hh; Atl-M

LAMIACEAE

162. *Teucrium scordium* L.: D (16); H; Eua
163. *Scutellaria galericulata* L.: B (29), C1 (36), D (48, 61, !), E (!), F (18, !); H; Cp
164. *S. hastifolia* L.: B (16, 54), D (61), F (18); H; Ec

165. *Stachys palustris* L.: B (29), C1 (68), D (48, 61), F (18); H (G); Cp
166. *Lycopus europaeus* L.: B (23, 29, !), C1 (41), D (42, 48, !), E (!), F (18, !); Hh; Eua
167. *L. exaltatus* L.: A (16, !), D (49, 61), F (17); Hh; Eua
168. *Mentha pulegium* L.: D (61, !), F (18); H; Eua
169. *M. arvensis* L.: B (29), C1, C2 (68), D (48, !); H-G; Cp
- ssp. *arvensis* var. *pascuorum* Top.: B (16)
 - var. *foliicoma* (Opiz) Top.: B, D (16)
 - ssp. *austriaca* (Jacq.) Briq. var. *austriaca*: A, B, C2, D (16)
 - var. *fontana* (Weihe) Top.: D (16)
170. *M. verticillata* L.: B (!), D (48, 49, 61, !); H; E
- var. *ovatifolia* Top.: B, D (16)
 - var. *tortuosa* (Host) Top.: A, B, D (16)
 - var. *serotina* (Host) Top.: A, B, D (16)
 - var. *montana* (Host) Top.: A (16)
171. *M. aquatica* L.: B (290, D (16, 32, 49), E (32), F (17, 18, 32); Hh-H; Eua
- var. *stagnalis* Top.: D (16)
172. *M. longifolia* (L.) Nathh.: A-F; H (G); Eua
- ssp. *longifolia* var. *ensidens* Briq.: B (16)
 - var. *favрати* (Des. et Dur.) Briq.: A (16)
 - var. *recta* (Des. et Dur.) Top.: A (16)
 - var. *huguenini* (Des. et Dur.) Briq.: B, D (16)
 - var. *vallesiaca* (Briq.) Trantm.: A (16)
 - var. *szamosiana* Top.: D (16)
 - ssp. *mollissima* (Borkh.) Dom.: D (16)
 - ssp. *incana* (Willd.) Guşul.: D (16)
173. *M. x hirta* Willd. (*longifolia* x *aquatica*):
- f. *grintzescui* (Prod.) Guşul.: D (16)
- PLANTAGINACEAE
174. *Plantago maritima* L.: B (49), D (10, 16, 61); H; Eua
- ssp. *maritima* f. *leptophylla* Mert. et Koch: D (16)
 - ssp. *serpentina* (All.) Arc.: D (16)
 - f. *angustissima* (Schur) Paucă et Nyár.: D (16)
175. *P. cornuti* Gouan: B (49), D (10, 16, 20, 61); H; E
- GENTIANACEAE
176. *Menyanthes trifoliata* L.: A (16), B (16, 29), C1 (37), D (16, 61); Hh; Cp
177. *Centaureum littorale* (D. Turner) Gilmour.:
- ssp. *uliginosum* (W. et K.) Rothm.: D (16); Th-TH; Eua
178. *Swertia punctata* Baumg.: C1 (37, 38, 51, 68, !); H; Carp-B
- RUBIACEAE
179. *Asperula rivalis* Sibth. et Sm.: A (16), B (29), D (16, 61), F (17); H; Eua
180. *Galium uliginosum* L.: A (16), C1 (36, 37), C2 (68), D (16); H; Eua
181. *Galium palustre* L.: C1 (37, 53, 68), C2 (22, 68, !), D (42, 48), F (17, 18, !); H; Cp
- ssp. *elongatum* (Presl.) Lange: F (17)
 - ssp. *transsilvanicum* Pázm.: E (34)

VALERIANACEAE

182. *Valeriana officinalis* L.: A (24, !), B (29), C1 (11, 38, 41, 68, !), C2 (22, 68), D (61); H; Eua

- var. *latifolia* Vahl.: D (16)

- f. *altissima* (Hornem.) Koch: D (16)

- var. *media* Koch: D (16)

183. *V. sambucifolia* Mikan: C1 (68), D (16); H; Ec

184. *V. simplicifolia* (Rchb.) Kabath.: C1 (16, 36, 37, 51, 53, 68), C2 (44, 68, !); H; Ec
DIPSACACEAE

185. *Succisa pratensis* Mnch.: A (160, B (29, !), C1 (36, 51, 68), C2 (68), D (16), E (!), F (18); H; Eua

- f. *glabrata* (Schott) Jáv.: C1 (36), D (16)

186. *S. inflexa* (Kluk) Yundz.: F (18); H; Ec

CUCURBITACEAE

187. *Echinocystis lobata* (Mchx.) Torr. et Gray: B (16), D (!), E (32, !), F (17, 26, 59, !); Th; Adv

188. *Sicyos angulata* L.: B (16), D (16, 49, 61), F (17); Th; Adv

ASTERACEAE

189. *Eupatorium cannabinum* L.: A-F; H; Eua

190. *Solidago canadensis* L.: D (16, 48), F (26); H; Adv

191. *S. gigantea* Ait.: D (160, F (17, !); H; Adv

192. *Aster punctatus* W. et K.:

- ssp. *punctatus*: D (16, 49), F (17, 26, 59); H; Eua

193. *A. tripolium* L.: D (10, 42, 61, !); H; Eua

194. *A. salignus* Willd.: B, D (16); H; Adv

195. *Gnaphalium uliginosum* L.: B (29), D (16, 48), F (17); Th; Eua

196. *Inula helenium* L.: B (29), D (16, 61); H; Adv

197. *Pulicaria dysenterica* (L.) Gaertn.: D (16, 48); H; E

198. *P. vulgaris* Gaertn.: B (160, D (61), F (18, !); Th; Eua

199. *Telekia speciosa* (Schreb.) Baumg.: A (!), B (49), C1 (51, 68), C2 (68, !), D (12, 61); H; Carp-B-Cauc

200. *Helianthus decapetalus* L.: A (!), B (30, !), D, E, F (17, 26, !); H; Adv

201. *Rudbeckia laciniata* L.: D (16, 48, 49, 61), F (17); H; Adv

202. *Bidens tripartita* L.: B (23, !), C1, C2 (68), D (40, 42, 48, !), E, F (!); Th; Eua

- f. *pumila* (Roth) Nyár.: D (16)

203. *Bidens cernua* L.: C2 (68), D (48, 61), F (17, 18, !); Th; Eua

- f. *minima* (Huds.) Nyár.: D (16, 48)

204. *Petasites hybridus* (L.) G. M. Sch.: B (23), C1 (41, !), C2 (68), D (12, 61), F (17, 18); G (H); Eua

205. *P. kablikianus* Tausch: A (16), C2 (68); G (H); Carp-B

206. *Senecio paludosus* L.: C1 (37), D (49); H; Eua

207. *S. fluviatilis* Wallr.: D (16, 48, !); H; Eua

208. *Ligularia sibirica* (L.) Cass.: A (16); H; Eua (Bor)

209. *Carduus personata* (L.) Jacq.: A, C1, C2 (!); H; Ec
 - var. *simplicifolius* Sanguin: C1 (68), D (16)
 - var. *agrestis* (Kern.) Hay.: C1 (68)
210. *Cirsium palustre* (L.) Scop.: C1 (37); TH; Eua
211. *C. brachycephalum* Jur.: A (16); TH-H; Pn
212. *C. canum* (L.) All.: B (29), C2 (!), D (10, 12, 61), E (!), F (18); G (H); Eua
213. *C. rivulare* (Jacq.) Link.: A (24), B (29), C1 (37, !), C2 (68), D (12, 61); H; Ec
214. *C. oleraceum* (L.) Scop.: B (29), C1 (68), C2 (6, 68, !), D (61); H; Eua
215. *C. heterophyllum* (L.) Hill.: C1 (16, 36, 37, 51), C2 (68); G (H); Eua
216. *Taraxacum bessarabicum* (Hornem.) Hand.-Mazz.: D (16, 42); H; Eua
217. *T. palustre* (Lyons) Symons: A (16), D (16, 61); H; E
 - f. *scorzonera* (Gaud.) Hay.: D (16)
218. *Sonchus paluster* L.: C1 (68), D (16); H; Eua
 - f. *hungaricus* Kárp.: D (16)
219. *Crepis paludosa* (L.) Mnch.: C1 (36, 38, 68), C2 (44); H; E
- ALISMATACEAE**
220. *Alisma plantago-aquatica* L.: B (29), D (32, 42, 48), F (17, 18, !); Hh; Cosm
221. *A. lanceolatum* With.: A (!), B (29), C2 (68), D (10, 61, 66), F (17); Hh; Eua
222. *Sagittaria sagittifolia* L.: F (16, 17, 26); Hh; Eua
- BUTOMACEAE**
223. *Butomus umbellatus* L.: B (29), D (61), F (17, 18, !); Hh; Eua
- HYDROCHARITACEAE**
224. *Stratiotes aloides* L.: D (16), F (17, 18, 62); Hh; Eua
225. *Hydrocharis morsus-ranae* L.: F (16, 17, 26, 62); Hh; Eua
- JUNCAGINACEAE**
226. *Scheuchzeria palustris* L.: C1 (37, 45), C2 (16, 44, 68, !); G; Cp
227. *Triglochin maritima* L.: A (16, 54), B (16, 49, 54), D (10, 16, 42, 65); H; Cosm
228. *T. palustris* L.: D (16, 20, 65, 66); H; Cp
- POTAMOGETONACEAE**
229. *Potamogeton pectinatus* L.: D (16, 61, 62, 66); Hh; Cosm
 - var. *interruptus* (Kit.): Aschers. D (61)
230. *P. crispus* L.: D (61, 62, 66, !), F (17); Hh; Cosm
 - f. *serrulatus* (Schräd.) Topa: D (16)
231. *P. pusillus* L.: A, B (16, 62), C2 (62), D (16, 62, 66); Hh; Cosm
232. *P. nodosus* Poir.: F (17, 59, !); Hh; Cp
233. *P. natans* L.: B (16, 62), C1 (68), C2 (16, !), D (12, 42, 61, 66), F (17, 18, 26); Hh; Cosm
 - var. *prolixum* Koch: D (16, 62)
 - f. *ovalifolius* Fieb.: D (16)
 - f. *pygmaeus* Gaud.: D (16)
234. *P. lucens* L.: D (16, 62, 66), F (26); Hh; Eua
235. *P. gramineus* L.: F (17); Hh; Cp
236. *Ruppia rostellata* Koch: D (62); Hh; Cosm
 - var. *obliqua* (Schur) Topa: C2 (16), D (16, 66)

237. *Zannichellia palustris* L.: D (16); Hh; Cosm

- ssp. *pedicellata* Wahlbg.: D (10, 62)

- var. *aculeata* (Schur) Töpa: D (16, 42, 61, 66)

NAJADACEAE

238. *Najas minor* All.: F (16, 26); Hh; Eua

TYPHACEAE

239. *Typha latifolia* L.: A-F; Hh; Cosm

240. *T. minima* Funk.: F (!); Hh; Eua

241. *T. angustifolia* L.: B (29), D (42, 61), F (18, !); Hh; Cosm

SPARGANIACEAE

242. *Sparganium minimum* Hill.: A, B (16, 54, 62), C1 (37); Hh; Cp

243. *S. emersum* Rehmman: A, D (16) F (26); Hh; Eua

244. *S. erectum* L.:

- ssp. *erectum*: C1, C2 (68), D (49, 61, !), F (18); Hh; Eua

- ssp. *microcarpum* (Neum.) Dom.: D (16)

- ssp. *neglectum* (Beeby) Sch. et Thell.: B (29), D (16)

IRIDACEAE

245. *Gladiolus imbricatus* L.: B (29), C1 (37, 50), D (61), F (17); G; Eua

246. *Iris pseudacorus* L.: B (16, 29, 49, 54), D (16, 49, 61), E (!). F (16, 18, !); G-Hh; E

247. *Iris spuria* L.: D (16); G; Pn-D

248. *Iris sibirica* L.: D (16, 61), F (16, 18, 26); G; Eua

JUNCACEAE

249. *Juncus bufonius* L.: A-F; Th; Cosm

250. *J. compressus* Jacq.: B (29, 49), D (16, 39, 42, 48), F (18); G; Eua

251. *J. gerardi* Lois.: B (29), D (16, 42, 61), F (26); G; Cp

252. *J. filiformis* L.: C2 (44, 68, !); H; Cp

- var. *transsilvanicus* (Schur) A. et G.: C1 (37)

253. *J. alpinus* Vill.: C1 (37); H; Cp

- var. *fuscoater* (Schreb.) I. Grinț.: C1 (36)

254. *J. effusus* L.: A-F; H; Cosm

- var. *compactus* Lej. et Court.: C1 (36), D (49)

255. *J. conglomeratus* L.: C1 (45, !), C2 (44), D (61, !), E (!); H; Eua

256. *J. inflexus* L.: C2 (68), D (16, 39, 42, 48); H; Eua

257. *J. articulatus* L.: B (29), C1 (36, 53, 68), C2 (68), D (16, 20, 48, 61) F (17); H; Cp

258. *J. atratus* Krock.: A (16), B (16, 29), D (61), F (17); H; Eua

259. *J. thomassii* Ten.: A (16), C2 (16, 68), D (61); H; D-B

CYPERACEAE

260. *Scirpus sylvaticus* L.: A (16, 24, 54, !), B (29, !), C1 (36, 53, !), C2 (22, 68, !), D (12, !), E (!); Hh-G; Cp

261. *S. radicans* Schuhr: B (16); G; Eua

262. *Eriophorum vaginatum* L.: C1 (36, 37, 45, 53, 68), C2 (44, 68, !); H; Cp

263. *E. angustifolium* Honckeney: C1 (37, 45, 68), D (61); G; Cp

264. *E. gracile* Koch: A (16); G; Cp

265. *E. latifolium* Hoppe: A (24), C1 (36, 37, 68), C2 (68); H; Eua
 266. *Bolboschoenus maritimus* (L.) Palla: B (!), D (10, 42, 48, !), E (!), F (17, 26, !); Hh; Cosm
 - var. *compactus* (Hoffm.) Hay.: D (16)
 267. *Isolepis supina* (L.) R. Br.: F (17); Th (Hh); Cosm
 268. *Schoenoplectus triqueter* (L.) Palla: D (16); Hh-G; Eua
 269. *S. lacustris* (L.) Palla: B (29, 49, !), D (42, 61, !), E (!), F (18, 28, !); Hh-G; Cosm
 270. *S. tabernaemontani* (Gmel.) Palla: D (16, 20, 61, 65); Hh-G; Eua
 271. *Eleocharis quinqueflora* (Hartm.) O. Schwarz: D (16); H; Cp
 272. *E. acicularis* (L.) R. Br.: B (16), F (17, 18); Th; Cp
 273. *E. carniolica* Koch: C1 (37), F (26); Th; Alp-Carp-B
 274. *E. ovata* (Roth) Roem. et Shulz.: A (16), F (17); Th; Cp
 275. *E. uniglumis* (Link.) Schult.: B (29), D (16, 49); G (Hh); Cp
 276. *E. palustris* (L.) R. Br.: A (24), B (29, !), C1 (68), C2 (68, !), D (42, 48, 61, !); G (Hh); Cosm
 - var. *casparyi* (Abromeit.) Borza: D (16)
 - f. *salina* Schur: D (61)
 - ssp. *mamillata* (Lindb.) Blauverd.: F (17)
 277. *Cyperus fuscus* L.: A, B (16), D (16, 48, 61), F (17, 26); Th; Eua
 - var. *virescens* (Hoffm.) Vahl.: A, D (16);;
 278. *Blysmus compressus* (L.) Panzer: A (16), C2 (68), D (16); G; Eua
 279. *Chlorocyperus glomeratus* (Torn.) Palla: D (48), F (17); Hh; Eua
 280. *Pycreus flavescens* (L.) Rchb.: A, B, D (16), F (17); Th; Cosm
 281. *Dichostylis micheliana* (L.) Nees.: F (17); Th; Eua
 282. *Rhynchospora alba* (L.) Vahl.: C1 (37, 45), C2 (44); H; Eua
 283. *Cladium mariscus* (L.) Pohl.: D (16); Hh; Cosm
 284. *Carex pauciflora* Lightf.: C1 (16, 36, 37, 45, 68), C2 (16, 37, 44, 68, !); H; Cp
 285. *C. vulpina* L.: B (29, 49), C1 (50), D (10, 16, 42, 61), F (17, 18); Hh-H; Eua
 - f. *crassinervis* (Schur) Kük.: D (61)
 286. *C. divisa* Huds.: D (16);;
 287. *C. diandra* Schrank.: A (16), D (61); G; Cp
 288. *C. paniculata* Jusl.: C1 (16, 36); Hh; Ec
 289. *C. leporina* L.: A (24), B (29), C1 (36, 45, 50, 53, !), C2 (44); H; Eua
 290. *C. bohemica* Schreb.: F (59); H; Eua
 291. *C. canescens* L.: B (29), C1 (36, 37, 45, !), C2 (44, 68); H; Cp
 292. *C. elongata* L.: B (29); H; Eua
 293. *C. stellulata* Good.: C1 (36, 50, 53, !), C2 (44, 68, !), D (61); H; Cp
 294. *C. remota* Grufb.: D (61), F (17); H; E
 295. *C. limosa* L.: A (16), C1 (16, 37, 45, !), C2 (68); H; Cp
 296. *C. paupercula* Michx.: C1 (45), C2 (37, 44); H; Cp
 297. *C. pendula* Huds.: A (16), C1 (68), D (61); H; Atl-M
 298. *C. nigra* (L.) Reichard.: B (29), C1 (36, 45, 68, !), C2 (44); G; Cp
 299. *C. gracilis* Curtis: A (16), B (29, 49), C1 (53, 68, !), D (12, 16, 61), E (!); Hh-G; Eua
 300. *C. elata* All.: B (29); Hh; E

301. *C. buekii* Wimm.: B (16), D (7, 16, 61); Hh; P-Pn
 302. *C. distans* L.: B (29, 49), D (10, 39, 42, !); H; E
 303. *C. flava* L.: A (!), C1 (53), C2 (44, !), D (61); H; Cp
 304. *C. lepidocarpa* Tausch.: C1 (36, 68); H; E
 305. *C. acutiformis* Ehrh.: B (29), D (61), E (!), F (18); Hh; Eua
 306. *C. melanostachya* Willd.: B (29); Hh; Eua
 307. *C. riparia* Curt.: B (29, 49), D (32, 42, 61), E (!), F (18); Hh; Eua
 308. *C. rostrata* Stokes: A (16), B (29), C1 (37, 45, 68, !), C2 (44, 68, !), D (16); Hh; Cp
 309. *C. vesicaria* L.: A (16), B (29), C1 (36), C2 (44), D (16, 63); Hh; Cp
 310. *C. pseudocyperus* L.: A (16), B (29), D (16, 42); Hh; Cp
 311. *C. x tetrastachya* Trautst. (*canescens* x *stellulata*): C1 (16, 36, 68);
 312. *C. x corcontica* Domin (*limosa* x *paupercula*): C2 (16);
 313. *C. x pannewitziana* Figert (*rostrata* x *vesicaria*): D (16);
 POACEAE
 314. *Echinochloa crus-galli* (L.) P. Beauv.: C1 (68), D (16, 25, 48, !), E, F (!); Th; Cosm
 315. *Typhoides arundinacea* (L.) Mnch.: B (49, !), C1 (68), D (20, 49, 61), E (!), F (18); Hh-H; Cp
 316. *Leersia oryzoides* (L.) Sw.: D (49), F (18, 26); Hh; Cp
 - *f. patens* Wiesbg.: D (16)
 317. *Alopecurus ventricosus* Pers.: B (29); H; Eua
 318. *A. pratensis* L.: A-F; H; Eua
 319. *A. geniculatus* L.: B (29), C1 (37), C2 (68), D (16, 39), F (16, 18); H; E
 320. *A. aequalis* Sobol.: C1 (36, 37), D (39, 48), F (17); H; Cp
 321. *Heleochoa alopecuroides* (Piller) Host.: F (17, 18); Eh; Eua
 322. *H. schoenoides* (L.) Host.: D (16, 48, 61); Th; Eua
 323. *Agrostis stolonifera* L.: A-F; H; Cp
 324. *Calamagrostis canescens* (Web.) Druce: D (16); H; Eua
 325. *C. neglecta* (Ehrh.) Gaertn.: A (16); H; Cp
 326. *C. pseudophragmites* (Haller) Koeler: B (!), C1 (68), D (63), E, F (!); H; Eua
 327. *Phragmites australis* (Cav.) Trin. et Steud.: A-F; Hh; Cosm
 - *var. flavescens* Custer: A, B, D (16)
 328. *Deschampsia caespitosa* (L.) P. Beauv.: A-F; H; Cosm
 329. *Molinia coerulea* (L.) Mnch.: B (29), C1 (36, 45, 51, !), D (61), F (26); H; Eua
 - *ssp. coerulea* *var. robusta* Prah.: A (16)
 - *ssp. arundinacea* (Schränk) Paul.: B (16), C1 (37)
 - *ssp. litoralis* (Host.) Paul.: A (16)
 330. *Poa palustris* L.: B (29, !), D (42, 49), F (17, 26); H; Cp
 331. *P. remota* Forsk.: A (16); H; Eua
 332. *P. trivialis* L.: B (29, 49), C1 (36, 68), C2 (22, 68, !), D (16, 39, !), E, F (!); H; Eua
 - *f. glabra* (Döll) Nyár.: C1 (37), D (16)
 333. *Catabrosa aquatica* (L.) P. Beauv.: B (49), D (39, 48, 61), F (4, 26); H; Cp
 - *f. salina* (Schur) Nyár.: D (16)
 334. *Glyceria maxima* (Hartm.) Holmberg: B (49, !), D (12, 49, !), F (18); Hh-H; Cp
 - *var. arundinacea* (M. B.) Hay.: D (16)

335. *G. fluitans* (L.) R. Br.: C1, C2 (68), D (16); Hh-H; Cosm
 336. *G. plicata* Fries: B (29, !), C1, C2 (68), D (61), E (!), F (18); Hh; Eua
 337. *G. nemoralis* (Uechtr.) Uechtr. et Koern.: D (39, 42, 61); Hh; Ec-Sarm
 338. *Festuca pratensis* Huds.: A-F; H; Eua
 - ssp. *pratensis* var. *subspicata* (G.F.W.Meyer) A. et G.: B, D (16)
 - ssp. *appenina* (De Not) Hegyi: F (26)
 339. *F. arundinacea* Schreb.: B (29), C1 (68), C2 (44), D (10, 49, 61), F (26); H; Ec
ORCHIDACEAE
 340. *Orchis laxiflora* Lam.: F (18, 26); G; Eua
 - ssp. *elegans* (Heuff.) Soó: B (29, 49), D (16), E (!)
 341. *O. incarnata* L.: A (16), B (16, 29), C1 (68), D (16, 61); G; Eua
 - var. *haematodes* (Rchb.) Paucă et Beldie: B, D (16)
 342. *O. latifolia* L.: A (16, !); G; Ec
 343. *O. cordigera* Fries: A (16, 54), C2 (68); G; Alp-Carp-B
 344. *O. x maculatiformis* Rouy (*incarnata* x *maculata*): A, D (16)
 345. *Epipactis palustris* (L.) Cr.: A (16), B (16, 29), D (16, 61); G; Eua
ARACEAE
 346. *Acorus calamus* L.: D (16), F (18, 26); Hh (G); Adv
 347. *Calla palustris* L.: C1 (16, 37); Hh; Cp
LEMNACEAE
 348. *Lemna trisulca* L.: B (29), D (61, 62), F (17, 18, 26, 28); Hh; Cosm
 349. *L. minor* L.: B (29), D (10, 61, !), E (!), F (17, 18, 26, !); Hh; Cosm
 350. *L. gibba* L.: A (16), B (16, 29), D (62), F (17); Hh; Cosm
 351. *Spirodela polyrrhiza* (L.) Schleiden: E (!), F (17); Hh; Cosm
 352. *Wolffia arrhiza* (L.) Harkel: F (17); Hh; Atl-M

The aquatic and paludal vegetation

Generally speaking, the vegetation of the Valley of Someș has a vertical distribution: typical mountainous associations on the superior courses of Someșul Mare, Someșul Cald and Someșul Rece (respectively „A“, C1“ and „C2“ sectors), hilly and plateau vegetaion on the inferior course of Someșul Mare, on the course of Someșul Mic, and on the first segment of the „united“ Someș („B“, „D“ and „E“ sectors), and lowland vegetation on the inferior course of the „united“ Someș („F“ sector). In the previous chapter we have already pointed out some characteristics of the vegetation of the Someș sectors. From the 200 identified vegetal associations a number of 91 are aquatic or paludal ones (Table 1.). These belong to 34 alliances, 23 orders and 19 classes.

Rivers	No. of species	No. of associations	No. of aquatic and paludal sp.	No. of aquatic and paludal associations
Someșul Mare	909	84	254	39
Someșul Cald	734	61	132	36
Someșul Rece	583	36	115	27
Someșul Mic	1049	108	233	56
Someșul "Unit"	759	75	235	36
Total	1670	200	352	91

Table 1. The distribution of the macrophyte species and associations in the Someș Valleys

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: B (29), D (61, 62, !), E (!), F (26, 28, !)

Utricularion vulgaris Pass. 1964

2. *Lemno-Utricularietum vulgaris* Soó 1928: D (62, 65)

POTAMETEA Tx. et Prsg. 1942

POTAMETALIA W. Koch 1926

Ranunculion aquatilis Pass. 1964

3. *Ranunculo trichophylli-Callitrichetum cophocarpae* Soó (1927) 1960: D (61, 62)

4. *Callitrichetum cophocarpae-palustris* (Rațiu 1966) Drg. 1989: C1 (!)

Potamion W. Koch 1926 emend. Oberd. 1957

5. *Myriophyllo-Potametum* Soó 1934: D (61, 62), F (26)

- *myriophylletosum verticillati* Soó 1957: D (61)

- *myriophylletosum spicati* Soó 1957: D (12, 61)

6. *Potametum crispum* Soó 1927: D (61, 62, !), F (26)

7. *Parvopotameto-Zannichellietum* (Baumann 1921) W. Koch 1926: D (65)

- *potametosum pusilli* Soó (1927) 1973: D (62)

Nymphaeion Oberd. 1957 emend. Neuhausl 1959

8. *Potametum natantis* Soó 1927, Eggler 1933: B (!), D (12, 42, 61, !)

9. *Polygonetum natantis* Soó 1927: D (61)

- *potametosum natantis* Soó 1964: D (61)

10. *Potametum lucentis* Hueck 1931: F (26)

RUPPIETALIA J. Tx. 1960

Ruppion maritimae Br.-Bl. 1931

11. *Ruppium rostellatae* (Todor 1948) Pop et all. 1988: D (61)

PHRAGMITETEA Tx. et Prsg. 1942

PHRAGMITETALIA W. Koch 1926 emend. Pign. 1953

Phragmition australis W. Koch 1926 emend. Soó 1947

12. *Scirpo-Phragmitetum* W. Koch 1926: B (29, !), D (7, 12, 32, 42, 53, !), E (!)

- *phragmitetosum* Soó 1957: B (!), D (10, !), E, F (!)

- *glycerietosum maximae* Pázmány 1966: D, E (32)

13. *Typhaetum angustifoliae* (All. 1922) Pign. 1943: F (!)

- *typhaetosum latifoliae* Pop et all. 1988: B (29), F (28)

14. *Typhaetum latifoliae* Soó 1927: C2 (!), D (42, !), F (!)

15. *Schoenoplectetum lacutris* Eggler 1933: B (49, !), D (42, !), F (1)

16. *Glycerietum maximae* Hueck 1931: B (!), D (12, 49, !), F (1, 55)

Bolboschoenion maritimi Soó (1945) 1947

17. *Bolboschoenetum maritimi* Soó (1927) 1957: B (!), D (10, 42, 61, !), E (!)

18. *Schoenoplectetum tabaernemontani* Soó (1927) 1949: D (61, 65)

19. *Eleocharietum palustris* Schennikov 1919, Soó 1933: B, C2 (!), D (42, !)
 NASTURTIO-GLYCERIETALIA Pign. 1953
 Glycerio-Sparganion Br.-Bl. Et Siss. Ex Boer 1942
20. *Equiseto-telmateji-Glycerietum nemoralis* Szabo 1971: D (61)
 21. *Sparganio-Glycerietum fluitantis* Br.-Bl. 1925: D (65)
 22. *Glycerietum plicatae* Oberd. (1952) 1957: B (29, !), D, E (!)
 Phalarido-Glycerion Pass. 1964
23. *Equisetetum fluviatilis* Soó (1927) 1947: C2 (!)
 24. *Phalaridetum arundinaceae* Libb. 1931: D, E (!)
 25. *Calamagrostietum pseudophragmitis* Beldie 1967, Kopecky 1968: B, D, E (!)
 MAGNOCARICETALIA Pign. 1953
 Magnocaricion elatae W. Koch 1926
26. *Caricetum rostratae* Rübel 1912: B (29), C2 (!)
 27. *Carici-Menyanthetum* Soó (1938) 1955: B (29)
 28. *Caricetum gracilis* Almquist 1929, Grabner et Hueck 1931, Tx. 1937: B (29, 49), C1 (!), D (12, 49), E (!), F (28)
 29. *Caricetum acutiformis* Sauer 1937: D (12, 61), F (!)
 - *caricetosum ripariae* Soó 1957: B (29), F (1, 55)
 30. *Caricetum ripariae* Soó 1928: B, D (49)
 31. *Caricetum vulpinae* Soó 1927: B (29, 49), D (61)
ISOETO-NANOJUNCETEA Br.-Bl. Et Tx. 1943
 NANOCYPERETALIA Klika 1935
 Nanocyperion flavescens W. Koch 1926
32. *Pycreo-Juncetum* Soó et Csűrös 1944: D (48, 61)
 33. *Juncetum bufonii* Morariu 1956, Philippi 1968: C1 (!)
 34. *Peplido-Limoselletum aquaticae* Philippi 1968: B (29)
 35. *Dichostyli-Gnaphalietum uliginosi* (Horvatic 1931) Soó et Tímár 1947: F (17)
MONTIO-CARDAMINETEA Br.-Bl. Et Tx. 1943
 MONTIO-CARDAMINETALIA Pawl. 1928
 Cardamini-Montion Br.-Bl. 1925
36. *Cardaminetum amarae* (Rübel 1912) Br.-Bl. 1926: C1 (!)
 - *chrysosplenietosum* (Lungu 1971) Drg. Hoc loco: C2 (!)
SCHEUCHZERIO-CARICETEA NIGRAE Nordh. 1936
 SCHEUCHZERIO-CARICETALIA NIGRAE (W. Koch 1926) Görs et Müller ex. Oberd. 1967
 Rhynchosporion albae W. Koch 1926
37. *Rhynchosporietum albae* W. Koch 1926: C1 (45, 56)
 38. *Caricetum limosae* Br.-Bl. 1921: C1 (45)
 Caricion canescenti-nigrae (W. Koch 1926) Nordh. 1936
 39. *Carici stellulatae-Sphagnetum* Soó (1934) 1954: C1 (45), C2 (44, !)
 - *nardetosum strictae* Lupşa 1971: C2 (!)
 40. *Carici rostratae-Sphagnetum* Zólyomi 1931: C1 (45, !), C2 (44, !)
 TOFIELDIETALIA Prsg. apud Oberd. 1949
 Eriophorion latifolii Br.-Bl. Et Tx. 1943

41. *Carici flavae-Eriophoretum* Soó 1944: A, B (!), D (65)

OXYCOCCO-SPHAGNETEA Vr.-Bl. Et Tx. 1943

SPHAGNETALIA Pawl. 1928

Sphagnion fusci Br.-Bl. 1920

42. *Sphagnetum fusci* Luq. 1926: C1 (53)

43. *Eriophoro vaginato-Sphagnetum recurvi-magellanicum* (Weber 1902) Soó (1927) 1954: C1 (45, !), C2 (44, !)

- *callunetosum* Lupşa 1971: C2 (!)

- *empetrosum nigrae* Lupşa 1971: C2 (!)

- *empetroso-callunetosum* Lupşa 1971: C2 (!)

- *cardaminosum pratensis* Pop et all. 1988: C1 (!)

- *caricetosum rostratae* Lupşa 1971: C1 (!)

MOLINIO-ARRHENATHERETEA Tx. 1937

MOLINIETALIA w. Koch 1926

Calthion palustris Tx. 1937

44. *Calthaetum laetae* Krajina 1933: C1 (50, !), C2 (22, 56, !)

- *eriphorosum angustifolii* Resmeriţă 1969: C1 (!)

45. *Scirpetum sylvatici* Schwick. 1944: B (!), D (61), E (!)

46. *Epilobio palustri-Juncetum effusi* Oberd. 1957: A (24), B (29)

47. *Cirsietum cani* Tx. 1951: C1 (!)

48. *Cirsietum rivularis* Ralski 1931: C1 (!)

49. *Cirsio-Polygonetum bistortae* Tx. 1951: B (29), C1 (!)

Holco-Juncion Pass. 1964

50. *Holcetum lanati* Issler 1936: C1 (50)

Filipendulo-Petasion Br.-Bl. 1947

51. *Filipenduletum ulmariae* W. Koch 1926: C1, C2 (!), D (61)

52. *Chaerophylletum hirsuti* (Soó 1927) Krajina 1933: C1, C2 (!)

53. *Petasitetum hybridi* (Dost. 1933) Soó 1940: B (23), C1 (!)

Agrostion stoloniferae Soó (1943) 1971

54. *Agrostietum stoloniferae* (Újvárosi 1941) Burduja et all. 1956: A-F (!)

- *eleocharetosum* Soó 1964: D (61)

- *poetosum trivialis* Soó 1957: B, D (!)

- *ranunculetosum repentis* Soó 194: D, E (!)

- *narcissetosum stellaris* Mititelu et Dorca 1987: B (29)

55. *Poaetum pratensis* Răvăruţ et all. 1956: B (29), D (!)

56. *Alopecuretum pratensis* Regel 1925, Nowinski 1928: A (!), D (10, 12, !), E, F (!)

- *deschampsietum caespitosae* (Soó 1947) Drg. Hoc loco: D (12), E (!)

- *ranunculetosum acris* Juhász apud Soó 1957: E (!)

- *agrostideto-festucetum pratensis* Soó 1947: F (!)

57. *Festucetum pratensis* Soó 1938: B (49, !), C1 (50), D (7, 12, 42, 49, !), E (!), F (28, !)

- *dactyletosum glomerati* Grigore 1971: D (49, !)

- *caricetosum distantis* Pázmány 1971: E (!)

58. *Agrostideto-Festucetum pratensis* Soó 1949: D (12, 49), E (!)

59. *Poaetum trivialis* Soó 1940: D (12)
60. *Caricetum distantis-vulpinae* Todor 1947: D (10)
61. *Ranunculo strigulosi-Equisetetum palustris* Gh. Popescu 1975: C2 (!), D (61)
- Deschampsion caespitosae (Horvatic 1930) Soó 1971
62. *Agrostio stoloniferae-Deschampsietum caespitosae* Újvárosi 1947: B (29), D (49, 61, !), F (1, 55)
- NARDO-CALLUNETEA** Preising 1949
- NARDETALIA (Oberd. 1949) Preising 1949
- Potentillo ternatae-Nardion Simonn 1957
63. *Carici-Nardetum strictae* Resmeriță et Pop 1986: C1 (!)
- PUCCINELLIO-SALICORNIETEA** Țopa 1939
- FESTUCO-PUCCINELLIETALIA Soó 1968
- Juncion gerardii Wendelbg. 1943
64. *Juncetum gerardii* (Warming 1906) Wenzl. 1934: D (42)
65. *Plantagini cornuti-Agrostietum stoloniferae* Soó et Csűrös 1944: D (42, 65)
66. *Triglochineto maritimae-Asteretum pannonicum* (Soó 1927) Țopa 1939: B (29), D (10, 61, 65)
- ARTEMISIETEA** Lohm., Prsg. et Tx. 1950
- CALYSTEGIETALIA SEPIUM Tx. 1950
- Calystegion sepium Tx. 1947 ex Oberd. 1949
67. *Calystegietum sepium* (Tx. 1947) Pass. 1964: D (!)
68. *Stenacti-Solidaginetum* Oberd. 1957: D (49)
69. *Polygonetum cuspidati* Tx. et Raabe 1950 apud Oberd. 1967: D, E, F (!)
70. *Helianthetum decapetali* Morariu 1967 n.n.: B (30), D, F (!)
71. *Eupatorietum cannabini* Tx. 1937: C2, E (!)
- BIDENTETEA TRIPARTITI** Tx., Lohm. et Prsg. 1950
- BIDENTETALIA TRIPARTITI Br.-Bl. Et Tx. 1943
- Bidention tripartiti Nordh. 1940
72. *Bidentetum tripartiti* (W. Koch 1926) Libbert 1932: B (!), D (65), E (!)
- *polygonetosum hydropiperi* Tx. 1937: D (!)
73. *Bidentetum cernui* Slavnic 1951: F (!)
- PLANTAGINETEA MAJORIS** Tx. et Prsg. 1950
- PLANTAGINETALIA MAJORIS Tx. (1947) 1950
- Agropyro-Rumicion crispi Nordh. 1940
74. *Rumici-Alopecuretum geniculati* Tx. (1937) 1950: D (!), F (28)
75. *Lolio-Potentilletum anserinae* Knapp 1946: A (24), B (!), D (39), E (32, !), F (!)
76. *Rorippo silvestri-Agrostietum stoloniferae* (Moor 1958) Oberd. et Th. Müller 1961: B (!)
77. *Ranunculetum repentis* Knapp 1946 emend. Oberd. 1957: D, E (!)
78. *Juncetum effusi* Soó (1931) 1949: B, C2, F (!)
79. *Junco-Menthetum longifoliae* Lohm. 1953: D (!), F (28)
- EPILOBIETEA ANGUSTIFOLII** Tx. et Prsg. 1950
- PETASITO-CHAEROPHYLLETALIA Morariu 1967
- Telekion Morariu 1967 n.n.
80. *Petasito-Telekietum speciosae* (Morariu 1967 n.n.) Beldie 1967: A (!)
- *matteucciosum* Drg. Hoc loco: A (!)

BETULO-ADENOSTYLETEA Br.-Bl. 1948

ADENOSTYLETALIA Br.-Bl. 1931

Adenostylion alliariae Br.-Bl. 1925

81. *Carduo personatae-Heracleetum palmati* Beldie 1967: C1, C2 (!)

- *angelicosum archangelicae* Drg. 1984: C2 (!)

SALICETEA PURPUREAE Moor 1958

SALICETALIA PURPUREAE Moor 1958

Salicion albae (Soó 1930 n.n.) Müller et Görs 1958

82. *Salici-Populetum* (Tx. 1931) Mejer Drees 1936: D (7, 61), E, F (!)

83. *Salicetum albae-fragilis* Issler 1926 emend. Soó 1957: B (!), D (12, 61, !), F (17, 26, !)

- *amorphosum fruticosae* Morariu et Danciu 1970: F (!)

- *cornetosum sanguineae* (Wendelbg. Zelinka 1952) Kárpáti 1958: D (32)

- *rubosum* Pázmány 1966: E, F (32)

- *echinocystosum* Drg. 1991: D, E (!)

84. *Salicetosum purpureae* (Soó 1934 n.n.) Wendelbg.-Zelinka 1952: B, C1 (!), D (12), E, F (26, !)

- *agrostetosum* Pázmány 1971: E, F (32)

85. *Salicetum triandrae* Malcuit 1929: B (32), D (12, 32, 61, !), E (32), F (17, 32)

- *amorphosum fruticosae* Borza 1954 n.n.: D (!)

- *agrostetosum* Pázmány 1966: E, F (32)

- *phragmitetosum* Kárpáti apud Pázmány 1966: D (12, 32)

- *salicetosum viminalis* Soó 1958: E (!)

Salicion eleagni (Aichinger 1933) Moor 1958

86. *Salici-Myricarietum germanicae* Moor 1958: B (5), C1, C2 (!), D (12, 61)

ALNETEA GLUTINOSAE Br.-Bl. Et Tx. 1943 emend. Müller et Görs 1958

SALICETALIA AURITAE Doing 1962 emend. Westh. 1969

Salicion cinereae Müller et Görs 1958

87. *Alno-Salicetum cinereae* (Kobendza 1930) Pass. 1956: B (29), E, F (!)

QUERCO-FAGETEA Br.-Bl. Et Vlieger 1937 emend. Soó 1964

FAGETALIA SILVATICAE (Pawl. 1928) Tx. et Diem. 1936

Alno-Padion Knapp 1942 emend. Medwecka-Kornas 1957

88. *Aegopodio-Alnetum glutinosae* Kárpáti et Jurko 1961: A, B (!), C1 (41), D (61)

- *matteuccetosum* Pócsi 1962: B (!)

- *caricetosum remotae* Zólyomi 1943: D (65)

89. *Alnetum glutinosae-incanae* Br.-Bl. (1915) 1930: B (23)

90. *Alnetum incanae* (Brockmann 1907) Aichinger et Siegrist 1930: A, C1, C2 (!)

- *matteuccetosum* Soó 1962, Lungu 1971: C2 (!)

- *salicosum* Lungu 1971: C1 (!)

VACCINIO-PINETEA Pass. Et Hofm. 1968

ERIOPHORO-PINETALIA Pass. Et Hofm. 1968

Eriophoro-Pinion Pass. Et Hofm. 1968

91. *Eriophoro-Pinetum silvestris* Hueck 1925 emend. Pass. Et Hofm. 1968: C1 (!)

Conclusions and proposals

The flora of the Someș Valleys is rich in species. These are varied as a result of the length of the river course which runs through several different forms of relief with different geological substrata and varied soils, as well as distinct climates.

The natural primary vegetation lacks almost totally, being replaced by a secondary one. Through repeated cutting the primary woods evolved towards the actual ones, with a medium to high degree of vitality or they were replaced by secondary lawns and agricultural crops.

In the last few decades a large number of adventive species (mostly from North-America and Asia) invaded the Someș rivers valley. Most of them formed hygromesophilous associations of adventive weeds, frequently dominated by a single species, or with a very low biodiversity, associations which modified the „aspect“ of the riverside and took the places of the primary vegetation. Among these species we mention: *Polygonum cuspidatum*, *Echinocystis lobata*, *Sicyos angulata*, *Solidago gigantea*, *S. canadensis*, *Helianthus decapetalus* and *Rudbeckia laciniata*.

The chorology of many species of plants and vegetal associations as well as their evolution is often (and in many places) disturbed or even halted by the human factor through a series of actions and activities like clearings, mowings, the intensive grazing, drainings and embankings, by the use of pesticides, etc. All these determined the disappearance of some tens of species of plants and vegetal associations from the floristic-phytocenologic inventory of the Someș Valleys - just in this century (e.g. *Marsilea quadrifolia*, *Hippuris vulgaris*, *Acorus calamus* etc.).

We have to mention the large peat-bogs from the Someșul Rece and Someșul Cald rivers, with a large number of protected species, like *Drosera rotundifolia*, *Drosera intermedia*, *Vaccinium oxycoccos*, *Empetrum nigrum*, *Eriophorum vaginatum*, *Salix pentandra*, etc.

The characteristics of the flora and vegetation, correlated to that of the water, points out the fact that the best preserved sectors, with a certain ecologic equilibrium are, in order, the „A“, „C2“, „C1“ and „B“ sectors, the otherd obviously degraded, with a precarious ecologic equilibrium, the destruction and pollution degree being higher in the „D“ sector, then in the „F“ and finally in the „E“ (Figure 1.).

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