Acta Botanica Hungarica 45 (3–4), pp. 355–363, 2003

TWO SUBASSOCIATIONS OF THE *SALICI CINEREAE-SPHAGNETUM RECURVI* (ZÓLYOMI 1931) SOÓ 1954

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(Received 18 July, 2003)

The physiognomy and the species composition of the *Salici cinereae-Sphagnetum recurvi* (Zólyomi 1931) Soó 1954 are variable in Hungary. This association has been divided into two new subassociations by the authors, due to the slight differences in their moss layer. As a representation they compared 27 phytocoenological relevés, made by 4 different botanists in 10 different mires, by multivariate analysis. Those peat moss dominated willow carrs, in which the dominant moss species are *Sphagnum squarrosum* and/or *Sphagnum fimbriatum* subsp. *fimbriatum,* are called *Salici cinereae-Sphagnetum recurvi sphagnetosum squarrosi* subass. nov., on the contrary those, in which any species of the *Sphagnum recurvum* agg. (*S. fallax*, *S. angustifolium*, *S. flexuosum*) and/or *Sphagnum palustre* are dominant, are called *Salici cinereae-Sphagnetum recurvi sphagnetosum recurvi* subass. nov. The two submitted subassociations of peat moss dominated grey willow carr are very similar. They could be found together or independently, on a terrestrial or on a floating mire. All of them are a part of the successional series of mire development, which can result a continental raised bog under recent climate, too.

Key words: Bereg Plain, grey willow carr, *Salici cinereae-Sphagnetum recurvi*, *Sphagnum*

INTRODUCTION

The physiognomy and the species composition of the *Sphagnum* dominated grey willow carr – the *Salici cinereae-Sphagnetum recurvi* (Zólyomi 1931) Soó 1954 – are variable in Hungary (Lájer 1998, Borhidi and Sánta 1999, Nagy 2002). This association has been divided into two new subassociations by the authors, due to the slight differences in their moss layer.

MATERIALS AND METHODS

The authors visited most of the Hungarian peat moss dominated mires between 1989 and 2002. They recorded hundreds of coenological data on them (Nagy 2002) using the Braun-Blanquet method (Braun-Blanquet 1951).

0236–6495/$ 20.00

Table 1
Conversion of the data of different authors into cover percentage (%)

Data types of Soó (1954)	Máthé and Kovács (1959)	Conv. into %	Data types of Lájer (1998)	Conv. into %
+		0.1	+	0.1
1		3	1	1
2		15	2m	3
3	1–4	40	2a	10
4		60	2b	20
5		90	3	40
+–1		1	4	60
1–2		5	5	90
2–3	1–3	25		
	2–4	35		
3–4		50		
4–5		75		

The compared 27 phytocoenological relevés (Table 2) made by 4 authors (relevés 1–6 – Soó (1954); relevés 7–9 – Máthé et Kovács (1959); relevés 10–21 – Lájer (1998); relevés 22–27 – Nagy and Réti (2002)), in ten different mires (Fig. 1), i.e. 2 on Báb-tava mire and 5 on Bence-tó mire (Csaroda, Bereg Plain, NE Hungary); 1 on Baktai-tó mire (Egerbakta, Bükk Mts, N Hungary); 4 on Ná-

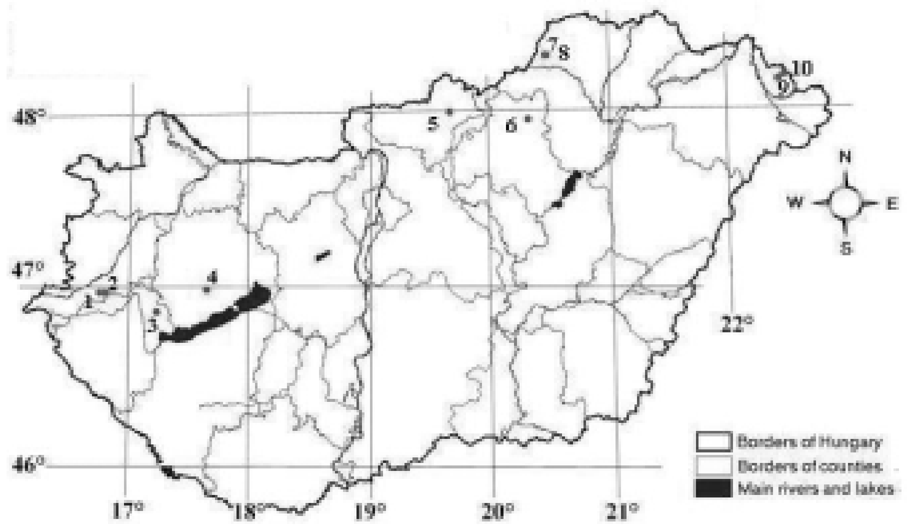

Fig. 1. Location of mires in Hungary. 1 = Gersekarát mire, 2 = Bertók-tó mire, 3 = Vad-tó mire, 4 = Nagy-tó mire, 5 = Nádas-tó mire, 6 = Baktai-tó mire, 7–8 = Kismohos-tó mire and Nagymohos-tó mire, 9 = Bence-tó mire, 10 = Báb-tava mire

Table 2

Coenological relevés of *Salici cinereae-Sphagnetum recurvi* (Zólyomi 1931) Soó 1954 (Relevés: 1, 4 = Nagymohos-tó; 2, 5 = Kismohos-tó; 3 = Baktai-tó; 6, 22, = Báb-tava; 7–9, 21 = Nádas-tó; 10–12 = Nagy-tó; 13–16 = Gersekarát; 17–18 = Vad-tó; 19–20 = Bertók-tó; 23–27 = Bence-tó.) Sources: 1–6 = Soó (1954), 7–9 = Máthé and Kovács (1959), 10–21 = Lájer (1998), 22–27 = Nagy (2002: dates: 22 = 18.07.1997; 23–25 = 17.08.1995; 26–27 = 20.08.1995)

Serial number of relevés	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
VASCULAR PLANTS																											
Lemnetea																											
Hottonia palustris	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5	–	–	–	–	–	–	–
Lemna minor	–	3	3	–	–	–	3	–	0.5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Phragmitetea																											
Alisma plantago- aquatica	–	–	–	–	–	–	–	–	–	–	–	0.5	–	–	0	–	–	–	–	–	–	–	10	–	–	–	–
Baldingera arundinacea	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5
Calamagrostis canescens	40	25	–	–	–	–	–	–	–	0.5	–	–	0.5	0.5	0.5	–	0.5	3	–	–	–	–	–	–	–	–	–
Galium elongatum	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.5	–	–	–	–	–	–	–
Iris pseudacorus	–	–	–	–	–	–	–	0.5	0.5	–	–	–	–	–	0	–	–	0.5	–	–	–	–	–	–	–	–	–
Juncus effusus	–	–	3	12	3	12	–	0.5	0.5	–	–	–	–	0.5	3	–	–	–	0.5	3	0.5	–	–	–	–	–	–
Lycopus europaeus	3	3	3	–	–	12	–	–	–	–	–	–	3	–	1	–	3	5	0.5	5	–	–	0.5	1	4	0.2	2
Lysimachia vulgaris	3	3	15	3	3	12	1	1	3	–	–	–	–	–	–	–	–	0.5	0.5	–	3	10	2	2	3	0.2	1
Lythrum salicaria	3	3	3	–	–	–	–	–	1	–	3	0.5	–	–	3	–	0.5	–	0.5	0	–	–	–	0.5	0.5	–	–
Oenanthe aquatica	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	0.1	–	–	–
Phragmites communis	90	35	–	90	90	–	50	25	50	–	3	3	–	–	–	90	3	3	–	–	90	–	–	–	–	–	–
Poa palustris	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–
Rumex hydrolapathum	–	–	–	–	–	–	–	–	–	–	–	–	–	50	–	–	–	–	–	–	–	–	–	–	4	–	–
Scutellaria galericulata	–	–	–	–	–	–	–	–	–	–	–	–	–	0	–	–	–	–	–	–	–	–	–	–	2	–	–
Sparganium erectum	–	–	–	–	–	–	0.5	0.5	0.5	–	–	–	–	–	–	0	–	–	–	–	–	15	–	–	–	–	–
Stachys palustris	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.5	0.5	–	–	–	–	–	–	–	–	–
Typha angustifolia	–	–	–	–	–	–	–	–	–	–	–	–	–	0.5	–	–	–	–	–	–	–	1	–	–	–	–	–
Eupatorium cannabinum	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.5	–	–	–	–	–	–	–	–	–
Glyceria maxima	–	–	–	–	–	–	–	–	–	–	–	–	–	–	50	–	–	–	–	–	–	–	–	2	–	–	0.5
Glyceria fluitans	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.5	–	–	–	–	–	–	–
Glyceria plicata	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Carex acutiformis	–	–	–	–	–	–	–	–	–	–	0.5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Carex gracilis	–	–	–	–	–	–	12	–	–	–	–	–	–	–	–	–	–	–	–	0.5	–	–	–	–	–	–	–
Carex pseudocyperus	3	–	–	–	–	3	–	–	–	3	3	3	–	–	–	–	–	–	–	–	–	–	0.5	–	0.3	–	0.1
Carex riparia	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Carex rostrata	–	–	40	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Table 2 (continued)

Serial number of relevés	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Carex vesicaria	–	–	–	–	–	–	–	25	3	–	–	–	5	–	–	–	–	–	5	–	–	–	–	–	–	–	–
Cicuta virosa	–	–	–	–	–	–	–	–	–	–	–	–	–	–	50	–	–	–	–	–	–	–	–	–	–	0.1	0.1
Epilobium palustre	3	3	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Galium palustre	3	–	3	–	–	–	0.5	0.5	0.5	–	0.5	–	–	–	–	–	0.5	0.5	–	0 .5	0.5	–	0.1	2	–	2	0.5
Menyanthes trifoliata	–	–	40	–	–	–	–	–	–	–	–	–	–	–	50	–	–	–	–	–	–	–	–	–	–	–	–
Eriophorum angustifolium	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Carex elata	3	–	–	–	–	3	–	–	–	–	–	0.5	–	–	–	–	3	3	3	3	–	–	–	–	–	–	–
Scheuchzerio-Caricetea nigrae																											
Drosera rotundifolia	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Carex lasiocarpa	3	3	–	3	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Molinio-Juncetea																											
Agrostis canina	–	–	–	–	–	–	–	–	–	–	–	–	–	–	50	–	–	5	3	–	–	–	0.2	–	5	–	0.2
Cardamine pratensis	–	–	–	–	–	–	–	–	–	–	–	0.5	–	–	50	–	–	–	–	–	–	–	–	–	–	–	–
Symphytum officinale	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	0.1	0.2
Salicetea purpureae																											
Rubus caesius	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.2
Alnetea glutinosae																											
Dryopteris carthusiana	–	–	–	–	–	–	0.5	–	–	–	–	–	–	–	–	–	–	0.5	0.5	0.5	3	–	3	5	2	2	4
Dryopteris cristata	3	–	3	–	–	–	–	–	–	–	–	–	–	–	–	0	–	–	–	–	–	1	–	–	–	–	–
Thelypteris palustris	25	25	25	3	3	3	–	–	–	5	3	3	–	–	3	–	3	3	–	–	3	30	–	50	–	–	–
Carex elongata	15	35	–	–	–	15	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Alnus glutinosa	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	20	–	–	–	–	–
Betula pubescens	–	3	3	15	12	–	–	–	–	0.5	–	0.5	–	–	–	–	–	50	–	–	–	–	–	–	–	–	–
Salix cinerea	12	75	3	–	–	–	40	3	12	90	90	90	90	90	90	90	90	90	60	90	90	70	100	100	95	100	95
Querco-Fagetea																											
Frangula alnus	–	3	–	–	–	50	–	–	–	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–	–
Geum urbanum	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.2	0.2
Athyrium filix- femina	–	–	–	–	–	–	–	–	–	–	–	–	–	–	50	–	0.5	–	–	–	–	–	2	–	–	–	–
Hedera helix	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	–	–	0.5	–	–	–	–	–	–	–	–	–
Betula pendula	–	–	–	–	–	–	–	–	–	–	0.5	0.5	–	–	0.5	0.5	–	–	–	–	–	–	–	–	–	–	–
Populus tremula	–	–	3	–	–	12	–	–	–	–	0.5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Quercus cerris	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.5	–	–	–	–	–	–	–	–	–	–	–	–
Quercetea-pubescenti-petraea																											
Rosa canina	–	–	–	–	–	–	–	–	–	–	–	–	–	–	50	–	–	–	–	–	–	–	–	–	–	0.1	–

Table 2 (continued)

Serial number of relevés	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Erico-Pinetea																											
Pinus sylvestris	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.5	–	–	–	–	–	–	–	–	–	–	–	–
Chenopodio-Scleranthea																											
Polygonum lapathifolium	–	–	–	–	–	–	–	–	–	–	–	–	–	50	–	–	–	–	–	–	–	–	1	–	–	–	–
Bidens cernua	–	–	–	–	–	–	–	–	–	–	–	–	–	–	50	–	–	–	–	–	–	–	–	–	–	–	0.1
Chenopodium polyspermum	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.5
Ranunculus sceleratus	–	–	–	–	–	–	–	–	–	0.5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Polygonum minus	–	–	–	–	–	–	–	–	0.5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Solanum dulcamara	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.5	3	–	–	–	–	1	2	10	0.5	2
Solidago gigantea	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.5	–	–	–	–	–	–	–	–	–
Stenactis annua	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	–	–	0.5	–	–	–	–	–	–	–	–	–
Urtica dioica	–	–	–	–	–	–	–	–	–	–	–	–	–	–	50	–	–	0.5	–	–	–	–	–	–	–	–	3
Chelidonium majus	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	–	–	0.5	–	–	–	–	–	–	–	–	–
Tussilago farfara	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.5	–	–	–	–	–	–	–	–	–
Chenopodium album	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	–	–	–	–	–	–	–	–	–	–	–	0.1
Cirsium arvense	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.1	–	–	–	–
Setaria lutescens	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Erechtites hieracifolia	–	–	–	–	–	–	–	–	–	–	–	–	–	0	–	–	0.5	–	–	–	–	–	–	–	–	–	–
MOSSES																											
Phragmitetea																											
Sphagnum centrale	3	40	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Sphagnum palustre	–	–	–	15	–	3	–	–	–	–	40	60	–	–	–	–	0	–	–	–	–	20	–	–	–	–	–
Sphagnum teres	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	–	–	–	–	–	–	–	–	–	–	–	–
Sphagnum subnitens	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–	–
Scheuchzerio-Caricetea nigrae																											
Sphagnum capillifolium	–	–	–	–	–	–	–	–	–	–	–	–	–	50	–	–	–	1	–	–	–	–	–	–	–	–	–
Sphagnum contortum	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5	3	–	–	–	–	–	–	–
Sphagnum fimbriatum	–	–	–	–	–	–	–	–	–	10	40	5	3	5	40	40	–	–	40	5	–	–	9	5	1	5	0.2
Sphagnum obtusum	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5	–	–	–	–	–	–	–	–
Sphagnum recurvum agg.	–	12	40	90	90	–	–	–	–	–	3	3	–	–	–	–	–	–	40	5	5	20	–	–	–	–	–
Sphagnum squarrosum	–	15	3	–	–	–	12	50	90	18	5	5	5	5	60	40	3	–	–	–	90	–	1	1	3	15	8
Other mosses	3	5	3	3	3	3	3	3	–	5	–	0.5	80	–	–	–	25	5	15	39	–	–	25	20	10	20	15

das-tó mire (Nagybárkány, Cserhát Mts, N Hungary); 2 on Kismohos-tó mire and 2 on Nagymohos-tó mire (Kelemér, Putnok Hills, N Hungary); 3 on Nagy-tó mire (Öcs, Bakony Mts, W Hungary); 2 on Bertók-tó mire and 4 on Gersekarát mire (Felső-Kemeneshát, W Hungary); 2 on Vad-tó mire (Keszthely Mts, Tátika group, W Hungary). Conversion of the data of different authors into cover percentage (%) can be seen in Table 1. We used 25 m^2 sampling plots and Lájer (1998) used 200 m^2 quadrates for sampling. There is no data about

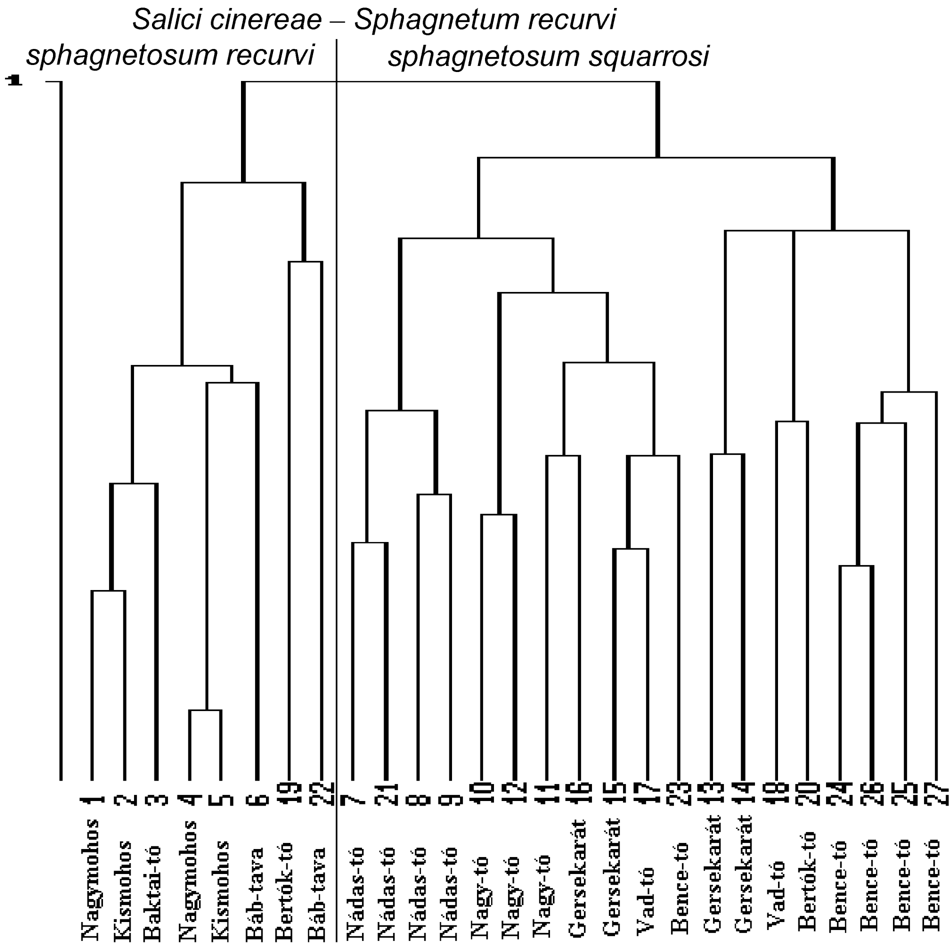

Fig. 2. Dendogram (hieararchical clustering, complete link, Kulzynski dissimilarity, single link resolution) for presenting the two subassociations of the peat moss dominated grey willow carr

the size of sampling plots of the relevés of Soó (1954) and Máthé et Kovács (1959) in their articles.

As a representation of the *Salici cinereae-Sphagnetum recurvi* (Zólyomi 1931) Soó 1954 association divided into two subassociations, we used SYN-TAX 5.0 computer program (Podani 1993) for hierarchical clustering (complete link, Kulzynski, dissimilarity, single link resolution, Fig. 2). Conversion of the data of different authors into cover percentage (%) can be seen in Table 1.

Within the phytosociological table (Table 2) the species are grouped according to their position in the syntaxonomic classes following the catalogue of Borhidi (1993). For the vascular plant names Borhidi (1993) and for the peat mosses Flatberg (1994) were considered.

We strictly followed the rules of the "Code of phytosociological nomenclature" (Barkmann *et al.* 1976, Borhidi 1996).

RESULTS AND DISCUSSION

The studied two subassociations made up two groups in the hierarchical clustering (Fig. 2). Those peat moss dominated willow carrs, in which the dominant moss species are the *Sphagnum squarrosum* and/or the *Sphagnum fimbriatum* subsp. *fimbriatum*, are called *Salici cinereae-Sphagnetum recurvi* (Zólyomi 1931) Soó 1954 *sphagnetosum squarrosi* subass. nov., on the contrary those, in which any species of the *Sphagnum recurvum* agg. (mainly the *S. fallax*, *S. angustifolium*, *S. flexuosum*) and/or the *Sphagnum palustre* are dominant, are called *Salici cinereae-Sphagnetum recurvi* (Zólyomi 1931) Soó 1954 *sphagnetosum recurvi* subass. nov.

Zonality, exposure: Both subassociations are edaphic. They can be found on the territories of slack waters of lakes and oxbow lakes. The *sphagnetosum recurvi* subassociation has higher water demands. It often belts the raising, central part of the Hungarian *Sphagnum* dominated mires. This could be present as a floating mire association, which builds up bogs (e.g. on the open waterside of the Báb-tava poor fen). The *sphagnetosum squarrosi* subassociation can partly be found on the nutrient rich, developing, floating edge of the *sphagnetosum recurvi* subassociation. Usually the *sphagnetosum squarrosi* subassociation develops earlier than the *sphagnetosum recurvi*. Both of them can be found individually formed by peat moss spreading (in terrestrial or floating) grey willow carrs (*Calamagrosti-Salicetum cinereae* Soó 1955), or by succession of peat moss dominated reed- and cat-tail (*Thelypteridi-Typhetum latifoliae* Nagy 1999) mires (Nagy *et al.* 1999).

Habitat: They are usually formed on non-calcareous peat soils with good water-capacity in valleys without downflow, or on the slack waters of lakes.

The *Salici cinereae-Sphagnetum recurvi* (Zólyomi 1931) Soó 1954 *sphagnetosum recurvi* subassociation exceedingly tolerates drastic water level increase, moreover it is competitive even in great water level fluctuation areas and it has thicker (moss) peat layer. The *Salici cinereae-Sphagnetum recurvi* (Zólyomi 1931) Soó 1954 *sphagnetosum recurvi* subassociation has lower water demands, it tolerates draught for several months, but its mosses' growing cannot follow quick water level increase (Nagy 2002).

Physiognomy: Their looks is determined by the roundly shapes of grey willows. They are usually checkered by high-grown *Typha angustifolia*, *T. latifolia*, *Phragmites communis*, or sometimes *Carex elata*, *C. acutiformis* and *C. riparia.* Their herb level is mostly poorish (the floating edges of the *sphagnetosum recurvi* subassociation can be rich in *Thelypteris palustris*). In the *sphagnetosum squarrosi* subassociation peat mosses are present not as a continuous cover, their parts are detached by water surfaces or grounds devoiding peat mosses. The moss level of the *sphagnetosum recurvi* subassociation is generally continuous.

Species composition: The differences between the two subassociations are based on the different peat moss taxa. In the *sphagnetosum squarrosi* subassociation the dominant species always are *Sphagnum squarrosum* and /or *Sphagnum fimbriatum* subsp. *fimbriatum.* Peat-forming of these species is still small. The two mentioned species are usually missing from the *sphagnetosum recurvi* subassociation or even they are present their coverage is rather less than that of the dominant species, *Sphagnum recurvum* agg. (*S. fallax*, *S. angustifolium*, *S. flexuosum*) or *Sphagnum palustre* species, which usually accompany them. Herb level is scanty here, but it can contain various species. Among ferns *Dryopteris cristata* is infrequent, it could only be found in the *sphagnetosum recurvi* subassociation and also the higher abundance of *Thelypteris palustris* is symptomatic in this subassociation. Nevertheless *Thelypteris palustris* can be present in the other community too, but only sparsely. The ferns of the *sphagnetosum squarrosi* subassociation *are Dryopteris carthusiana*, and occasionally *Athyrium filix-femina.* Species of the surrounding associations necessarily have basic effect on the undergrowth level of both subassociations since these species move into them and they remain there after the willow carr formation, too. *Salix cinerea* is dominant in the shrub level of both subassociations. We point relevé 4 (Soó 1954) as the reference quadrate of *Salici cinereae-Sphagnetum recurvi* (Zólyomi 1931) Soó 1954 *sphagnetosum recurvi* subass. nov. subassociation. Let the Holotype of *Salici cinereae-Sphagnetum recurvi* (Zólyomi 1931) Soó 1954 *sphagnetosum squarrosi* subass. nov. subassociation be the quadrate 25 (Bence-tó 17.08.1995.).

Occurrence: The peat moss dominated grey willow carr is rare in Hungary. The habitats of the *sphagnetosum squarrosi* stands at present: Sirok: Nyírjes-tó mire, Nagybárkány: Nádas-tó mire, Öcs: Nagy-tó mire, Petőmihályfa: Bertók-tó mire, Vindornyaszőlős: Vad-tó mire. These subassociations are extinct from their habitats in the Bereg Plain.

Coenological relevés of *Salici cinereae-Sphagnetum recurvi* (Zólyomi 1931) Soó 1954 *sphagnetosum recurvi* taken by Soó on Kismohos-tó mire, Nagymohos-tó mire, Báb-tava mire and Baktai-tó mire (in 1997 the mire dried out, *Sphagna* have disappeared), together with ours taken on Báb-tava mire and that one taken by Lájer on Bertók-tó mire, rich in *Sphagnum fallax,* all belong to this subassociation. This subassociation was also found in Nyíres-tó mire (Bereg Plain, NE Hungary), Nyírjes-tó mire (Mátra Mts, N Hungary), Bozsok-mire Kőszeg Hills (NW Hungary), Fekete-tó mire, Ördög-tó mire and other small mires in the Őrség and Vend-vidék region (W Hungary).

CONCLUSION

After studying the Hungarian peat moss dominated grey willow carr, we recognised that the peat mosses first settle under grey willows the *Sphagnum squarrosum* and *S. fimbriatum* subsp. *fimbriatum*. *S. palustre* follows them during the succession, then the species of *Sphagnum recurvum* group (*S. fallax*, *S. angustifolium*, *S. flexuosum*) come and eventually *Sphagnum magellanicum*. Other peat mosses can also occur, e.g. *Sphagnum teres*, *S. obtusum*, *S. subnitens*, they represent an intermediate state. The *Sphagnum squarrosum* and *S. fimbriatum* subsp. *fimbriatum* are the first stage of the succession series. These peat mosses are seemed to be easily settling on, which has fewer roles in long-term peat-forming process. While peat mosses standing for the last stages of the succession series have more and more important role in long-term peat moss formation and pioneer settling is not typical. In addition these peat moss species outplace those peat mosses before them in the succession series to the developing edges of the carrs. In the case of *Salici cinereae-Sphagnetum recurvi* (Zólyomi 1931) Soó 1954 *sphagnetosum recurvi* subass. nov. the *Salix cinerea* settles on these peat mosses or rather it roots into the peat soil formed by *Sphagna*.

The two submitted subassociations of peat moss dominated grey willow carr are close to each other. They could be found together and independently, on terrestrial and on floating mire. All of them are a part of the successional series of the mire development, which could result a continental raised bog on recent climate too on the Bereg Plain (Nagy 2002). Further investigation of their development and spreading is necessary.

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Acknowledgements – Special thank is to be given to Prof. Zoltán Tuba for his professional and moral contribution to these investigations and to Prof. Tamás Pócs and to Konrád Lájer for valuable comments on the manuscripts. The research was financed by the Directorate of the Hortobágy National Park.

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