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Studies on vegetation in Cserehát (North Hungary)

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ABSTRACT: Vegetation between hills Pipiske and Kánás in Cserehát was studied. From the communities recorded, relevés of *Festucetum pratensis, Cirsio cani-Festucetum pratensis, Caricetum elatae, Filipendulo-Geranietum pratensis* are presented in details. The necessity of nature conservation of the territory is discussed.

KEYWORDS: Cserehát, Hungary, vegetation, nature conservation

Introduction

Cserehát is a part of the North Hungarian Mountains, between rivers Hernád and Bódva. Until recently there has been hardly any botanical study in the region. According to an old military map from the period of JOSEPH II., there was large woodland in this sessile oak - turkey oak zone, which is substituted nowadays with various plantations. The great botanists of the last century (e.g. KITAIBEL and BORBÁS) also ignored the region. The latest literature emphasises only the presence of two species protected in Hungary, i. e. *Fritillaria meleagris* and *Polygonum bistorta* (JAKUCS 1961, SOÓ 1964-1985).

Larger stands of *Quercetum petraeae - cerris* forest have remained to the north and east-north of village Szemere (Mulató, Kánás, Pipiske, Kavicsos, Nagyerdő, Keselyű and its surroundings). Most stands of forests have been changed into pastures leaving behind oak or wild pear trees creating the typical recent landscape of the region. Meadows of the lower habitats are used as hay-fields. Arable fields, mostly cereals and corn cultures, are of low quality, especially in the dry climate of our decade.

The remnants of natural or semi-natural vegetation can be found on wet habitats, mostly accompanying rivers and streams. There are more or less unbroken stands of willow and alder communities along the streams. The undisturbed habitats of stratum springs are also good places for relict species.

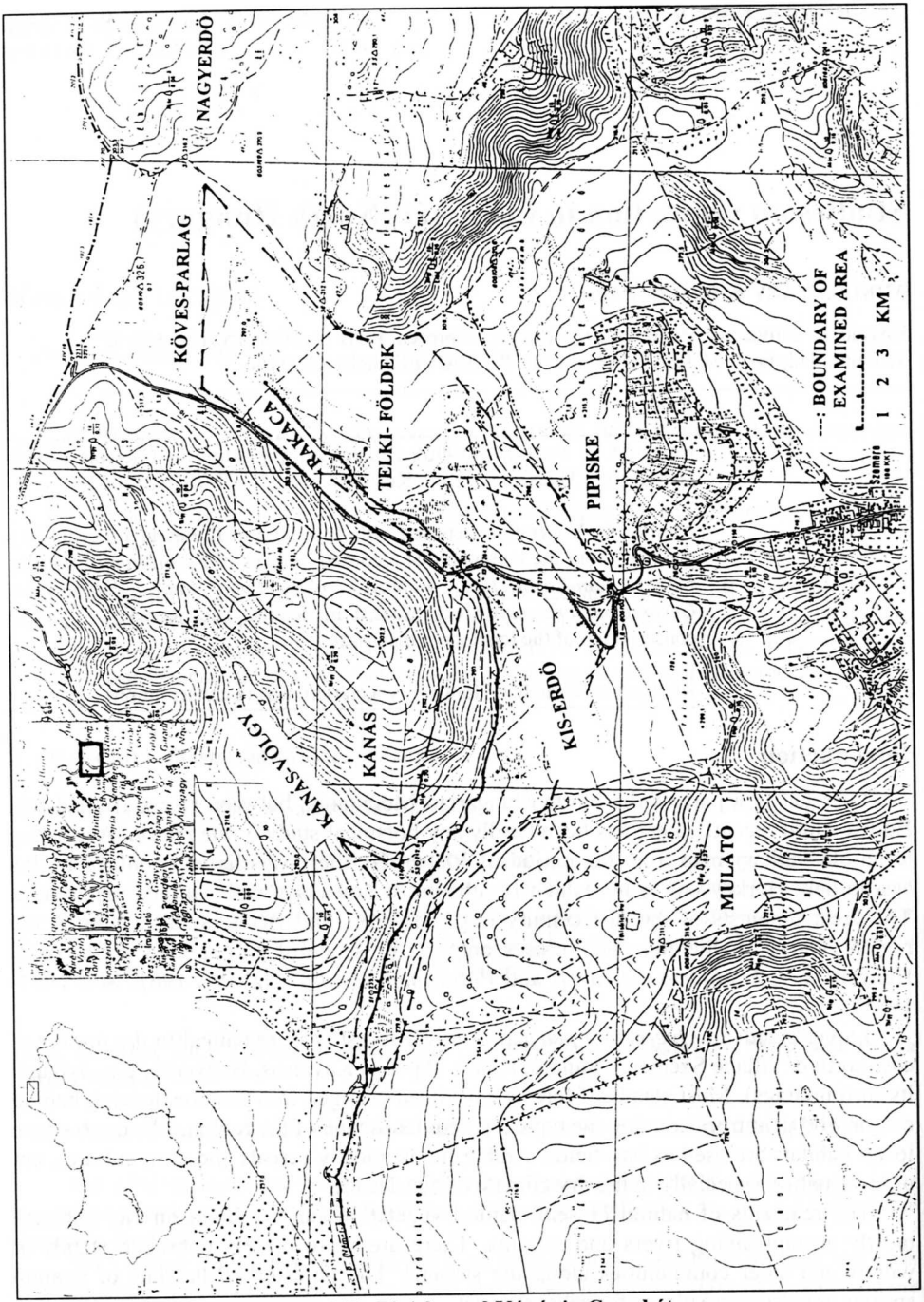

Fig. 1. Map of locality betweeen hills Pipiske and Kánás in Cserehát.

The valley of the stream Rakaca, running to Bódva river on the north part of the region, close to the Hungarian - Slovakian border, gives a good chance for the study of natural and semi-natural vegetation.

On both sides along the stream from the village Litka to Szászfa and on the north bank from Szászfa to Meszes, there is hardly any woody vegetation. Instead of them arable lands can be found. There are only smaller remarkable vegetation fragments close to the stream along these reaches. At the spring, near the village Szemere, nature shows its better face. The stream here runs to the West in its wide valley with diverse vegetation.

This upper section of stream Rakaca is worth not only studying but preserving too. That is why it was chosen for investigations. We present here some results of it.

Methods

We have worked in the Rakaca valley since 1991. Those communities have been chosen for detail phytocoenological studies which are valuable for nature conservation management. We worked along the stream from the spring to the west, studying mostly the wet habitats (NAGY & PAPP 1992, PAPP & NAGY 1994).

Phytocoenological relevés were made in 4×4 m quadrates using only simple percentage values for the estimates of coverage. The relevés also include the names of species growing outside the quadrates. From the tables of relevés dendrograms were made with the help of Sörensen similarity indices. Community names are used after SOÓ (1968).

Results

The valley studied is between hills Pipiske and Kánás (Fig. 1.). The spring is on the east part of the valley, with wetland in a narrow strip, in the middle of a cow pasture. The pasture is a dry and semi-dry area with some shrubs and trees. Thousands of *Orchis morio* plants flower in springs towards the top of the Pipiske and in a narrow strip along the road crossing the valley.

Phytocoenological relevés were made in the pasture on about 260 and 290 m high above sea level. It represents a *Festucetum pratensis* community (Tab. 1). The species composition is not homogenous, the lower site being characterized by a higher moisture. The dendrogam made on the basis of Sörensen similarity indices also separates well the two lists (Fig. 2). Two subassociations can be distinguished (*poetosum pratensis* and *festucetosum sulcatae*).

The lower parts closer to the stream are mowed or not utilized. The vegetation varied here. Partly *Filipendulo-Geranietum,* partly the communities of *Magnocaricion* or *Salicetum cinereae* can be formed there. At the north-east end of the valley, close to the spring, a few polycormons of *Iris sibirica* are worth mentioning. In the *Salicetum,* at the edge of the community a small population of *Alchemilla monticola* and *Dryopteris cristata* can be found.

Number of old trees increases in the pasture towards the west, on the other side of the road. On the meadow *Polygonum bistorta* and *Fritillaria meleagris* live in small populations. The meadow represents a *Cirsio cani - Festucetum pratensis* community. Five relevés are presented here from this community (Tab. 2). The dendrogram (Fig. 3)

separates the fifth data series from the others, because the method used by us is sensitive to the numbe" of the species, and this series contains much more species than the others.

Within a *Salicetum* a stratum spring with its marshy vegetation was discovered in 1992. The region is composed from various loose Pannonian sediments. The sediment layers with different permeability against water alternate. On certain places, frequently where a river or a stream cuts into the surface (SZABÓ 1978, 1985) the layer with water can come out and provides condition for wet and mesophilous vegetation on the valley sides too. Despite the dry climate of the region (yearly precipitation sum 560-570 mm), this stratum spring always brings enough water to keep the site wet. Similar stratum springs are not rare in the region, but unfortunately their original vegetation has been destroyed in most cases.

The vegetation complex of the Rakaca valley stratum spring has developed no more than 1 km from the spring of Rakaca on the north slope of the valley, about 10 m above the stream bed.

The core of the vegetation complex is *Molinietum coeruleae.* Among the *Molinia coerulea,* tussocks of *Eriophorum latifolium* and *Eriophorum angustifolium* grow, both species protected in Hungary. *Polygonum bistorta, Parnassia palustris, Carex canescens* and *Carex flava* are also rare in the Hungarian flora. Other species, such as *Thelypteris palustris, Filipendula ulmaria, Carex panicea, Potentilla erecta, Lythrum salicaria* and others accompany them. The patch of about 300 m^2 is surrounded by a narrow stand of *Salicetum cinereae* community. In the herb layer there are many moss species. Among them *Climacium dendroides* and *Mnium undulatum* dominate. *Dryopteris carthusiana* also grows there. *Achillea ptarmica* individuals blossom at the edges.

Surrounding the willow bushes a wet meadow connects to the vegetation complex without weeds. The greatest value of it is the *Dactylorhiza majalis* population with about 400 individuals. The species of marshes mix here with the species of drier meadows. Namely, *Molinia coerulea, Scirpus sylvaticus, Filipendula ulmaria, Succisa pratensis, Sanguisorba officinalis* grow together with *Anthoxanthum odoratum, Phleum pratense, Chrysanthemum leucanthemum, Campanula persicifolia,* etc.

Instead of phytocoenological tables we give here the list of the species (Tab. 3) with their nature conservation values (SIMON 1988, Red Book of Hungary 1990).

At the bottom of the valley, close to the Rakaca, great number of *Fritillaria meleagris, Polygonum bistorta* and a few *Iris sibirica* tussocks can be found in a complex of *Filipendulo-Geranietum* and *Magnocaricion communities* (Tab. 4 & 5). The sedge communities are poor in species. *Scirpus sylvaticus* appears among them in patches.

Such type of vegetation complex, sometimes combining yet with *Cirsio cani-Festucetum pratensis* elements, covers large areas along the stream as far as the village Büttös.

In summary, we suggest that the Rakaca valley should be considered as a protected locality. With management, we could preserve a representative part of the old vegetation in Cserehát.

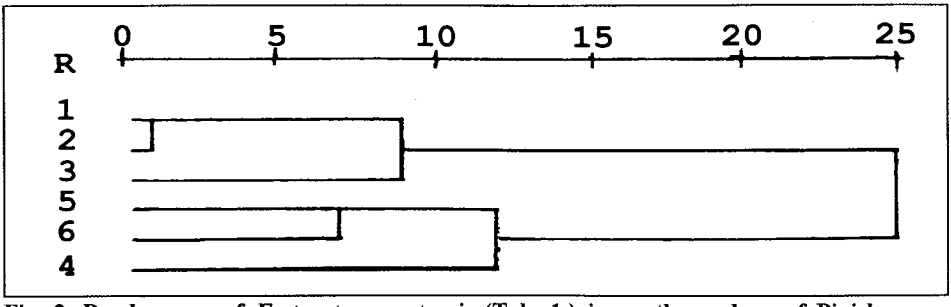

Fig. 2. Dendrogram of *Festucetum pratensis* (Tab. 1.) in northern slope of Pipiske, near Szemere R: number of relevé

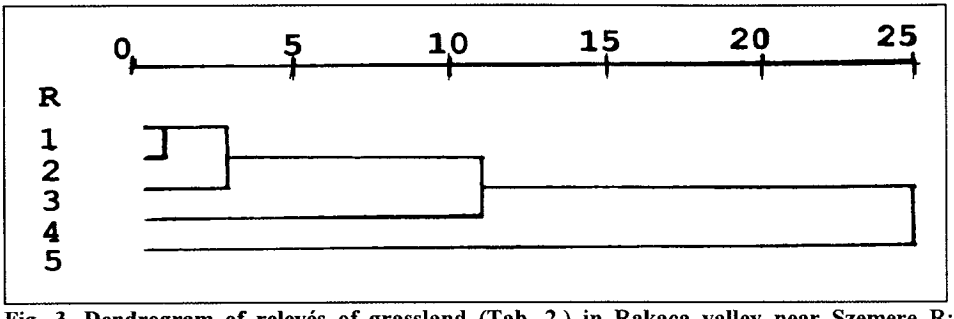

Fig. 3. Dendrogram of relevés of grassland (Tab. 2.) in Rakaca valley near Szemere R: number of relevé

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Tab. 1-5 on pages 82-87

Tab. 1. Szemere, northern slope of Pipiske 1991. ***Festucetum pratensis (poetosum pratensis and festucetosum sulcatae)***

Species	Relevés					
	Lower part			Higher part		
	1	2	3	4	5	6
Achillea millefolium	6	12	6	6	6	6
Agrimonia eupatoria	1	-	-	-	-	-
Agropyron repens	-	2	-	2	-	-
Agrostis alba	-	10	6	35	20	30
Alopecurus pratensis	2	2	2	2	4	-
Anthoxanthum odoratum	-	-	4	2	10	12
Arrhenatherum elatius	-	-	2	-	-	-
Briza media	-	-	-	-	2	8
Bromus mollis	-	-	-	2	-	-
Capsella bursa-pastoris	2	-	-	-	-	-
Carex pairaei	-	-	2	-	-	-
Carlina vulgaris	-	-	-	-	-	1
Centaurea pannonica	-	-	4	-	1	-
Cerastium vulgatum	4	4	4	2	2	2
Chrysanthemum leucanthemum	-	2	1	-	2	6
Convolvulus arvensis	2	-	-	-	-	-
Cynosurus cristatus	15	8	2	4	2	6
Dactylis glomerata	-	-	2	-	-	-
Danthonia provincialis	-	-	2	-	-	-
Daucus carota	1	2	2	-	-	-
Dianthus deltoides	-	-	4	2	1	2
Eryngium campestre	-	4	-	4	2	4
Euphorbia cyparissias	3	2	2	-	-	-
Festuca pratens	35	30	60	-	2	4
Festuca sulcata	-	-	4	55	30	10
Filipendula vulgaris	-	-	-	-	4	4
Fragaria vesca	-	-	-	2	2	15
Galium verum	-	-	-	2	-	-
Helianthemum canum	-	-	-	-	8	-
Hieracium pilosella	-	-	-	-	2	-
Hypericum perforatum	-	-	-	2	2	-
Koeleria cristata	-	-	-	6	15	2
Leontodon hispidus	-	-	2	-	2	4
Lolium perenne	25	5	4	2	-	-
Lotus corniculatus	2	2	-	-	-	2
Luzula campestris	1	-	2	6	4	4
Medicago lupulina	6	6	-	2	-	-
Medicago minima	-	-	-	8	2	2
Muscari comosum	-	-	-	1	-	-
Ononis hircina	1	2	-	-	-	-
Pastinaca sativa	-	2	-	-	-	-
Pimpinella saxifraga	3	4	3	4	2	2
Plantago lanceolata	2	4	2	2	2	2
Plantago media	2	2	2	1	2	1
Poa pratensis	20	20	8	25	8	6
Potentilla arenaria	-	-	-	2	-	2
Potentilla argentea	-	-	-	2	-	-

Tab. 1 - continued

	1	2	3	4	5	6
Potentilla recta	-	-	-	1	2	1
Prunella laciniata	-	-	1	-	-	-
Prunella vulgaris	1	-	-	-	-	-
Pyrus pyraster	-	-	-	-	2	-
Ranunculus acris	-	-	2	-	2	-
Ranunculus repens	2	-	2	-	-	-
Rhinanthus major	1	6	5	-	2	-
Rumex acetosella	-	-	-	4	-	-
Sanguisorba minor	-	-	-	2	-	4
Sonchus arvensis	2	2	1	-	-	-
Stellaria graminea	4	2	2	2	2	-
Taraxacum officinale	6	4	2	-	-	-
Thymus pulegioides	-	-	-	-	4	8
Trifolium arvense	-	2	-	4	1	1
Trifolium pratense	8	15	8	-	-	-
Trifolium repens	15	10	4	2	3	-
Trisetum flavescens	6	-	-	-	-	-
Veronica chamaedrys	1	2	-	4	8	2
Vicia tetrasperma	-	-	2	-	-	-

Tab. 2. Szemere, grasslands at the border of Telki-földek and Kiserdö 1991. *Cirsio cani-Festucetum pratensis*

Species	Relevés				
	1	2	3	4	5
Achillea collina	-	-	-	4	6
Agrimonia eupatoria	-	-	-	-	2
Agrostis alba	6	4	4	-	-
Alchemilla monticola	-	-	8	-	-
Allium angulosum	-	-	-	6	4
Alnus glutinosa	-	-	-	-	2
Alopecurus pratensis	60	70	4	20	-
Angelica sylvestris	4	2	-	4	4
Artemisia vulgaris	-	-	-	-	1
Ballota nigra	-	4	-	-	2
Briza media	-	2	-	-	1
Calamagrostis epigeios	-	-	-	-	4
Calamintha clinopodium	-	-	-	-	1
Caltha palustris	4	4	12	4	-
Carex acutiformis	-	2	4	-	-
Carex elata	40	4	20	30	30
Carex hirta	-	2	-	-	-
Carex leporina	-	-	2	2	-
Carex vulpina	8	2	2	6	4
Centaurea pannonica	-	-	-	-	2
Cirsium arvense	-	6	-	2	2
Cirsium canum	15	6	20	10	40
Cucubalus baccifer	-	1	-	-	-
Daucus carota	-	-	-	6	-
Deschampsia cespitosa	2	20	-	-	6
Epilobium hirsutum	2	-	-	-	-

Tab. 2 - continued

	1	2	3	4	5
Equisetum arvense	2	4	4	-	-
Festuca pratensis	2	4	20	15	2
Filipendula ulmaria	-	-	-	4	-
Fritillaria meleagris	-	-	-	4	-
Galeopsis pubescens	2	-	-	-	-
Galium aparine	4	4	6	-	-
Galium glaucum	-	-	-	2	-
Galium palustre	2	-	-	2	-
Galium uliginosum	4	-	4	2	-
Glechoma hederacea	-	-	2	-	-
Holcus lanatus	-	-	2	-	-
Inula britannica	2	-	-	-	2
Iris pseudacorus	-	-	-	-	2
Iris sibirica	4	-	-	-	-
Juncus compressus	-	-	-	2	-
Juncus effusus	-	-	-	-	2
Juncus inflexus	-	-	-	2	-
Lathyrus pratensis	6	4	10	4	2
Lycopus europaeus	-	-	-	2	-
Lycopus exaltatus	2	2	2	-	-
Lychnis flos-cuculi	2	2	-	2	2
Lysimachia nummularia	4	4	2	4	2
Lysimachia vulgaris	-	1	-	-	2
Lythrum salicaria	2	2	-	-	-
Lythrum virgatum	-	1	-	-	2
Mentha aquatica	2	-	6	-	2
Myosotis palustris	2	2	2	6	-
Odontites rubra	-	-	-	-	4
Oenanthe aquatica	-	-	-	8	
Ononis hircina	-	-	-	-	2
Phleum pratense	-	-	-	-	8
Phragmites communis	-	-	-	4	-
Poa pratensis	20	4	12	40	20
Poa trivialis	25	40	4	15	-
Polygonum aviculare	-	-	-	-	2
Polygonum bistorta	-	-	-	10	8
Ranunculus acris	2	2	4	2	4
Ranunculus repens	8	15	6	20	15
Rosa canina	-	-	-	-	2
Rumex acetosa	2	-	-	-	-
Rumex crispus	1	-	-	-	-
Sanguisorba officinalis	15	15	12	10	15
Scirpus sylvaticus	-	4	2	-	-
Scutellaria galericulata	8	2	-	2	2
Senecio fluviatilis	-	2	-	-	-
Serratula tinctoria	-	-	-	-	2
Solidago canadensis	-	-	-	-	2
Sonchus palustris	-	-	-	-	1
Stellaria graminea	2	-	2	-	-
Veronica serpyllifolia	2	-	-	-	-

Tab. 3. Rakaca-valley at Szemere, at the border of Kiserdö, 1992. List of species in *Carici flavae-Eriophoretum, Succiso-Molinietum* and *Calamagrosti-Salicetum cinereae* marshy complex

(NCRC: Nature Conservation Rank Categories of SIMON 1988. Natural species: U-unique (endemic, sub-endemic, relicts), KV-strictly protected species, V-protected species, E-predominating species in natural communities, K-main components, also native to the area, TP-natural pioneers, TZ-native species that tolerate disturbance. Species associated with human impact: A-adventitious weeds, G-cultivated plants, GY-cosmopolitan weeds).

NCRC	species names
K	*Achillea ptarmica*
K	*Alisma plantago-aquatica*
E	*Anthoxantum odoratum*
E	*Betula pendula*
K	*Briza media*
K	*Caltha palustris*
K	*Campanula persicifolia*
V	*Carex canescens*
K	*Carex flava*
E	*Carex elata*
GY	*Carex hirta*
K	*Carex leporina*
K	*Carex panicea*
TZ	*Centaurea pannonica*
K	*Chrysanthemum leucanthemum*
K	*Cirsium canum*
TZ	*Daucus carota*
V	*Dactylorhiza majalis*
V	*Dryopteris carthusiana*
V	*Eriophorum angustifolium*
V	*Eriophorum latifolium*
K	*Filipendula vulgaris*
K	*Filipendula ulmaria*
K	*Cruciata ciliata*
K	*Galium palustre*
K	*Geranium palustre*
K	*Holcus lanatus*
TZ	*Juncus effusus*
GY	*Inula britannica*
K	*Leontodon hispidus*
TZ	*Lychnis flos-cuculi*
K	*Lythrum salicaria*
K	*Lysimachia vulgaris*
K	*Lysimachia nummularia*
TZ	*Luzula campestris*
K	*Mentha aquatica*
E	*Molinia coerulea*
K	*Myosotis palustris*
GY	*Myosoton aquaticum*
V	*Orchis morio*
V	*Parnassia palustris*
E	*Phragmites communis*
TZ	*Phleum pratense*
K	*Poa pratensis*
V	*Polygonum bistorta*
K	*Potentilla erecta*
TZ	*Ranunculus repens*
TZ	*Ranunculus acris*
K	*Rhinanthus major*
TZ	*Rumex acetosa*
K	*Sanguisorba officinalis*
E	*Salix cinerea*
E	*Scirpus sylvaticus*
E	*Senecio jacobaea*
TZ	*Serratula tinctoria*
TZ	*Solanum dulcamara*
K	*Sonchus palustris*
K	*Succisa pratensis*
K	*Thelypteris palustris*
TZ	*Trifolium repens*
TZ	*Trifolium pratense*
TZ	*Veronica chamaedrys*

Tab. 4. Szemere, lower part of Kánás-valley 1992. ***Caricetum elatae***

Species	Relevés									
	1	2	3	4	5	6	7	8	9	10
Alopecurus pratensis	-	-	-	-	-	2	-	-	-	-
Angelica sylvestris	-	-	-	-	-	2	-	-	-	-
Caltha palustris	1	2	2	4	4	14	12	4	-	6
Carex acutiformis	2	12	80	10	40	-	-	-	8	60
Carex elata	95	85	15	4	12	60	70	4	60	4
Carex vesicaria	-	-	-	80	14	-	4	60	-	-
Carex vulpina	-	-	-	-	-	4	-	-	-	-
Cirsium rivulare	2	-	-	-	-	6	-	-	-	-
Cirsium vulgare	-	-	-	-	-	6	-	-	-	-
Filipendula ulmaria	2	-	2	-	40	-	-	-	2	4
Fritillaria meleagris	-	-	-	-	-	12	-	-	-	-
Iris pseudacorus	-	-	-	2	2	-	-	-	2	-
Lathyrus pratensis	4	4	-	-	-	6	-	-	-	4
Lycopus europaeus	-	4	-	-	1	2	-	1	-	2
Lychnis flos-cuculi	-	-	-	-	-	2	-	-	-	-
Lysimachia vulgaris	2	-	-	-	-	6	-	2	-	6
Mentha aquatica	-	-	-	-	-	-	-	-	2	4
Myosotis palustris	-	-	-	-	-	8	-	-	-	-
Phragmites communis	-	-	-	-	-	6	-	-	-	-
Poa pratensis	-	-	-	-	-	4	2	-	-	-
Ranunculus acris	4	-	-	-	2	4	-	2	-	1
Ranunculus repens	-	-	2	-	-	4	4	2	-	2
Polygonum bistorta	-	-	-	-	-	8	-	-	-	-
Rumex acetosa	-	-	-	-	-	2	-	-	-	-
Sanguisorba officinalis	2	-	-	-	-	14	8	12	10	2
Scirpus sylvaticus	-	-	-	-	-	-	2	-	-	-
Stachys palustris	1	-	-	2	-	-	-	-	-	2

Tab. 5. Szemere, Rakaca-valley 1992. ***Filipendulo-Geranietum palustris.***

Species	Relevés				
	1	2	3	4	5
Achillea setacea	1	2	-	-	1
Agrostis alba	-	2	-	2	-
Alopecurus pratensis	6	6	2	-	4
Angelica sylvestris	2	2	-	1	2
Briza media	2	-	1	-	1
Caltha palustris	4	6	2	2	4
Calamagrostis epigeios	1	-	-	-	1
Carex hirta	4	1	2	2	-
Carex leporina	1	6	2	-	1
Carex riparia	1	15	-	-	-
Carex vulpina	8	2	-	1	-
Centaurea pannonica	1	-	-	-	-
Cirsium canum	35	10	2	8	10
Cirsium arvense	1	-	-	-	1
Daucus carota	6	4	-	1	1
Equisetum arvense	40	8	10	6	4
Festuca pratensis	6	2	2	2	4
Filipendula ulmaria	4	40	25	60	30
Galium lucidum	-	2	-	-	-
Galium mollugo	2	2	-	2	-
Galium palustre	2	1	1	1	2
Glechoma hederacea	2	2	-	-	-
Geranium palustre	15	35	20	10	20
Hypericum perforatum	1	-	-	-	-
Juncus effusus	4	2	-	-	2
Lathyrus pratensis	-	4	-	2	2
Lycopus europaeus	2	-	2	2	-
Lysimachia nummularia	2	1	2	1	1
Lysimachia vulgaris	1	-	1	-	1
Lychnis flos-cuculi	2	-	1	1	1
Lythrum virgatum	2	-	1	-	-
Myosotis palustris	2	6	2	1	4
Poa pratensis	8	6	2	2	4
Poa trivialis	4	4	2	4	2
Potentilla reptans	4	-	-	1	-
Ranunculus acris	3	2	4	1	2
Ranunculus repens	-	2	2	-	2
Rumex acetosa	4	-	2	-	-
Scirpus sylvaticus	-	2	-	-	-
Veronica chamaedrys	-	4	-	-	-