DOI:10.24394/NatSom.2009.15.7 | Natura Somogyiensis | **15** | 7-14 | Kaposvár, 2009

A new forest fringes forb association: *Deschampsio caespitosae–Inuletum helenii* in SW-Hungary

JÁNOS DÁVID

University of Kaposvár Faculty of Pedagogy Department of Natural Sciences Methodology
H-7400 Kaposvár Guba Sándor u. 40., Hungary, e-mail: david.janos@ke.hu

DÁVID, J.: *A new forest fringes forb association: Deschampsio caespitosae–Inuletum helenii in SW-Hungary.*
Abstract: A new fringes forb association is described from the South Transdanubian Zselic Hills in SW Hungary. It develops at the lower parts of the slopes and bottoms in the wet valleys along the creekside alder-forests, characterized by the dominance of *Inula helenium* and species of reed vegetation and wet meadows.

Keywords: Zselic Hills, new forb association, SW-Hungary

Introduction

A new plant association was detected in the valleys of Forest of Vitorág, the southern part of the Zselic Hills, SW-Hungary. The hilly region is situated between the valley of Kapos river and the broad alluvial lowland of river Drava. The mainmass of the hilly region is built up of sediments of the Pannonian Sea during the Pliocene and covered by loess in the Pleistocene (BORHIDI 1984, MAROSI, SOMOGYI 1990). This loess cover has partly eroded during the Holocene, while on the remained loess ridges envolved steep slopes and narrow valleys evolved. The highest peaks are Ropoly (278 m) in the western and Hollófészek (357 m) in the eastern part of the Hills. On the broad central ridges zonal beechwoods (*Vicio oroboidi-Fagetum*) and hornbeam-oak woods with silverlime (*Helleboro dumetorum-Carpinetum*) (BORHIDI 1984, JUHÁSZ 2008) are prevailing. The southwards directed valleys – surrounded by steep (30-40°) slopes like the Vitorág valley – where the holotype stand of the association developed black meadow soils cover the lower part of slopes and the bottom of the valley at a height of 165 m and approximately horizontal situation. The ecotop of the stand is regularly flooded in spring time for shorter period. In the middle of summer the groundwater table is in 30–70 cm depth. The showy plant community was discovered and recognized in 1998, and its name and a short characterization published by the author in 2003 (in BORHIDI 2003:350.). The validating, the name and description of the association according to the syntaxonomic rules are published here, as follows.

ISSN 1587-1908 (Print); ISSN 2062-9990 (Online)

Table 1: The aggregated table of the association *Deschampsio caespitosae-Inuletum helenii*

Fajnév	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	K	ÉFO	FLE	COENOS	COENOB	TVK	SBT	TB	WB	RB	NB	LB	KB	SB
Deschampsia caespitosa	65	75	50	70	35	40	30	55	60	25	V	H	KOZ	0!	5.4.1.6.	K	C	6	7	6	3	7	5	0
Inula helenium	1	15	20	5	35	30	0	15	25	30	V	H	ADV	E411	8.4.3.3.	V	S	7	7	6	5	6	6	0
Juncus effusus	0.5	1	0	1	1	0.1	0.1	2	1	0.1	V	H	KOZ	I	INDIFF	TZ	DT	5	9	6	3	8	3	0
Lycopus europaeus	0.1	0.1	1	2	2	1	0.1	1	1.5	0.1	V	HH	EUA	H	INDIFF	K	DT	6	9	6	7	7	5	0
Lysimachia nummularia	0.1	0.1	1	1	1	1	0.1	1	0.1	0.1	V	CH	EUR	I	INDIFF	K	DT	6	7	8	4	5	4	0
Mentha pulegium	0	0.1	0.1	0.1	0.1	1	0.1	1	0.1	2	V	H	SME	I	INDIFF	TZ	DT	7	7	8	4	8	3	1
Filipendula ulmaria	0.1	0	0	0.1	0	1	0.1	1	0.1	0.1	IV	H	EUR	I	5.4.1.,	K	G	4	8	6	4	7	3	0
Ajuga reptans	0.2	0	0.1	1	0.1	1	0.5	0.1	1	0	IV	H-CH	EUR	B	INDIFF	TZ	DT	5	6	6	5	6	2	0
Brachypodium sylvaticum	0.1	0	0.1	0	1	1	0	1	0.5	0.1	IV	H	EUA	E	INDIFF	K	G	5	5	6	5	5	5	0
Equisetum telmateia	0.1	0	1	0.1	0.1	0	1	0.1	0	0.1	IV	G	CIR	E411	8.4.3.3	E	C	6	8	6	5	5	2	0
Fragaria vesca	0.1	0	0.1	1	0.1	0.1	0.1	0	1	0.1	IV	H	CIR	C	8.4	K	G	5	5	6	6	7	5	0
Lythrum salicaria	0	0.1	0	0.1	0.1	0.5	0.1	0.1	1	0.1	IV	H-HH	KOZ	I	1.5.	K	G	5	9	7	4	7	5	1
Polygonum hydropiper	0.1	0	2	1	1	0.5	1	0	0.1	1	IV	TH	CIR	H	3.2.1.	TZ	NP	5	9	7	5	7	4	0
Prunella vulgaris	0	0.1	0	0.1	0.1	0.1	0.1	0.1	1	0	IV	H	KOZ	I	INDIFF	TZ	DT	5	6	6	4	7	3	0
Ranunculus acris	0.1	0	0.1	0.2	0.1	0.1	1	1	0	0.1	IV	H	EUA	H	5.4.	TZ	G	5	7	6	3	7	3	0
Rubus hirtus	0	0.1	0.1	0.1	0.1	0.5	0.1	0	0	0.1	IV	H-N	CEU	C	8.6.1.2.	K	DT	6	5	6	6	7	4	0
Salvia glutinosa	0	1	2	0.1	0.5	0	1	0.1	0	0.1	IV	H	EUR	E41	8.4.3.	K	G	5	6	7	7	4	4	0
Trifolium repens	0	0.1	1	0.1	1	0.5	1	0	0.1	0.1	IV	H	KOZ	4	INDIFF	TZ	DT	5	5	6	7	8	3	1
Veronica chamaedrys	0	0.1	0.1	1	0.1	0.1	0.1	0.1	0	0.1	IV	H-Ch	EUA	C	INDIFF	TZ	DT	5	5	7	5	6	3	0
Achillea millefolium	0	0	0.1	0.1	0.1	0	0	0.1	1	0	III	H	KOZ	5	5.4	TZ	DT	5	6	5	5	8	5	1
Angelica sylvestris	0	0	0.1	0.1	0	0.1	0	0.1	0.1	0	III	H	EUA	H	INDIFF	K	G	6	8	6	6	7	5	0

Table 1 continued: The aggregated table of the association *Deschampsio caespitosae-Inuletum helenii*

Fajnév	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	K	ÉFO	FLE	COENOS	COENOB	TVK	SBT	TB	WB	RB	NB	LB	KB	SB
Anthriscus sylvestris	0	0	0.1	0.1	0	0.5	0.1	0	0.1	1	III	H	EUA	H	INDIFF	TZ	DT	6	5	7	8	7	5	0
Astragalus glycyphyllos	0.1	0	0	0.1	1	0	0.1	0.1	0.1	0	III	H	EUA	E	8.4	K	G	6	5	7	4	6	4	0
Bidens tripartitus	0	0	0.1	0.1	0	0.1	0.1	0.1	0	0	III	TH	EUA	I	3.2	TZ	W	5	8	6	8	8	5	0
Carex tomentosa	0	0.1	0	0.1	0	1	0	1	0.1	0.1	III	G	EUA	5	INDIFF	K	G	5	6	8	5	6	5	0
Cirsium oleraceum	0	0	0.1	0.1	0	1	0.1	0.1	0	0	III	H	EUA	5365	5.4.1.	K	G	5	7	8	5	6	3	0
Dipsacus laciniatus	0.1	0	0	0.1	0.1	0.1	0.1	0	0	0.1	III	TH	POM	A8	3.7	GY	W	6	7	8	5	9	3	0
Eupatorium cannabinum	0	0.1	0.1	0	0.1	0.1	0.1	0	0.1	0	III	H	EUA	I	INDIFF	TZ	DT	5	7	7	8	7	3	0
Odontites vulgaris	0.1	0.1	0	0.1	0	0.1	0	0.1	0.1	0	III	Th	EUA	I	INDIFF	TZ	DT	6	5	7	6	6	3	1
Phleum pratense	0	0	0	0.1	0.5	1	0.1	0	0	0.1	III	H	CIR	5	5.4	TZ	G	5	5	6	6	7	5	0
Physalis alkekengi	0.1	0	0	1	0	0.1	0	0.1	0.1	0	III	H	SME	E411	8.4.3.3	K	G	7	7	7	8	5	5	0
Solidago gigantea	0	0.1	1	2	1	0	0.1	0	0	0.1	III	H	ADV	A512	3.5.	K	AC	6	8	6	8	7	5	0
Tanacetum vulgare	0	0	0	1	0.1	2	1	0.1	0	0	III	H	EUA	A	3.5.2.1	K	W	5	5	6	5	8	4	0
Verbascum nigrum	0.1	0	0	0.1	0	0	0	0	0.1	0	III	TH-H	EUA	E6	6.2.	TZ	DT	5	4	7	7	7	5	0
Alopecurus pratensis	0	0.1	0	0.1	0	0	0	0.1	0	0	II	H	EUA	H	5.4	E	C	5	6	6	7	7	5	1
Ambrosia artemisifolia	0.1	0.1	0	0	0	0	0	0	0.1	0	II	TH	ADV	A	INDIFF	GY	AC	8	5	7	7	9	6	0
Calystegia sepium	0.1	0	0	0	0	0.1	0	0.1	0.1	0	II	H	KOZ	H	3.5.2.	K	DT	6	9	7	8	8	5	0
Colchicum autumnale	0	0.1	0	0	0.1	0	0	0	0	0.1	II	G	SME	5	5.4	K	G	5	6	7	4	6	2	0
Holcus lanatus	0	0.1	0	0	0.1	0	0.1	0	0	0.1	II	H(Ch)	EUR	5	5.4	K	G	5	6	6	4	7	3	0
Humulus lupulus	0	0	0	0	0.1	0	1	0.1	0.1	0	II	H	CIR	E113	INDIFF	TZ	DT	6	7	6	8	7	3	0
Knautia drymeia	0.1	0	0	0	0	0.1	0	0.1	0	0	II	H	CEA	E4	8.4.3.	K	G	6	6	6	5	5	6	0
Koeleria cristata	0	0	0	0.1	0.1	0	0	0	0.1	0	II	H	KOZ	9	5.3	K	G	6	3	8	2	8	6	0
Lathyrus pratensis	0.1	0	0.1	0	0	0	0.1	0	0	0.1	II	H	EUA	5	5.4	TZ	DT	5	7	7	6	7	4	0
Myosoton aquaticum	0	0	0.1	0.1	0	0	0.1	0	0	0.1	II	TH-TH	EUA			GY	DT	5	8	6	7	7	3	0
Urtica dioica	0	0	0.1	0.1	0	0	0	0.1	0	0	II	H	KOZ	I	INDIFF	TZ	DT	6	7	6	9	6	4	0
Allium scorodoprasum	0	0	0	0.1	0	0	0	0	0	0	I	G	CEU	I	INDIFF	TZ	DT	6	5	7	7	6	6	0

Material and method

Ten relevés were made in several valleys of the Zselic Hills between 23 September 1998 and 12 July 1999 both from the spring and the late summer aspects with classical phytosociological methods according to the Zürich-Montpelleir school, using sampling plots of 10 × 10 m = 100 m^2 size. and the A–D-values processed and evaluated with MS Exel 2007 program. The composition of the community was analyzed life-form and distribution type of the species and for their relative ecological indexes according to Ellenberg and Borhidi (ELLENBERG et al 1991, BORHIDI 1993) and for their social behaviour types according to BORHIDI (1993). The relevé no. 6 is selected for holotype of the association (table 1).

Characterization of the association

The association appears along the fringes of the oak-hornbeam forests where the alluvial oak-ash-elm forests (*Knautio drymeiae-Ulmetum*) or the creek-side alder forests have been cut and after the deforestation wet meadows developed under the human use for hay-meadow and grazing. The dominance of the medicinal plant *Inula helenium* a naturalized archeophyton originates from the important role playing in the wet forests of the region, as a characteristic species of the oak-ash-elm forests (BORHIDI 1984). Its prevailing going on after the cutting and grazing of the site untouched by the animals because of its poisonous property.

Physiognomy and structure

The community consists of two layers. The highest layer is formed by the dominant *Inula helenium* of 1.5–2 m height with a cover of 65–90%, followed by other tall forbs as *Filipendula ulmaria, Eupatorium cannabium, Equisetum telmateia, Angelica sylvestris, Urtica dioica, Solidago gigantea*, or with scattered individuals of *Carex pendula* and *Phragmites communis*. The lower layer is formed by medium sized plants and small forbs. In this usually very dense layer with cover up to 90–100% *Deschampsia caespitosa* is the dominant species followed by dense populations of *Aegopodium podagraria, Salvia glutinosa, Lythrum salicaria, Lysimachia nummularia, Mentha pulegium, Lycopus europaeus, Myosoton aquaticum, Trifolium repens*.

Constant species

Deschampsia caespitosa, Inula helenium, Juncus effusus, Lycopus europaeus, Lysimachia nummularia and Mentha pulegium.

Sub constant species

Ajuga reptans, Brachypodium sylvaticum, Equisetum telmateia, Filipendula ulmaria, Fragaria vesca, Lythrum salicaria, Polygonum hydropiper, Prunella vulgaris, Ranunculus acris, Rubus hirtus, Salvia glutinosa, Trifolium repens, Veronica chamaedrys.

Distribution of life-form

The ruling life-form type is the hemikryptophyta (Fig. 1). Concerning the number of species the hemitherophytes are the second but concerning the group-mass percentage, they do not reach the 10%.

Flora element distribution

According to the number the Eurasian and the cosmopolitan species prevail, beside them (10% participation) the circumpolar and the adventives species appear (Fig. 2). If

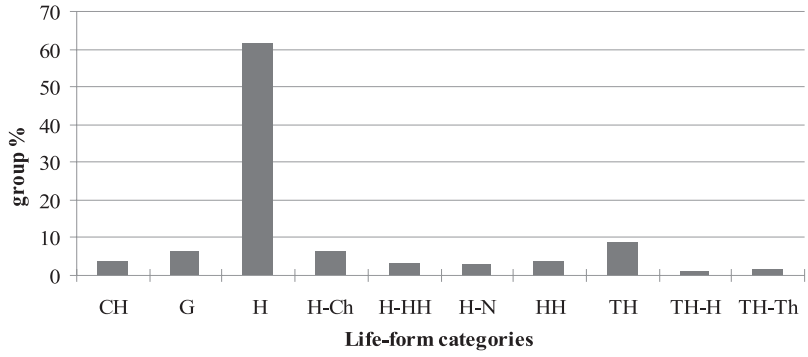

Fig. 1: The distribution of the lifestyle categories according to a group share

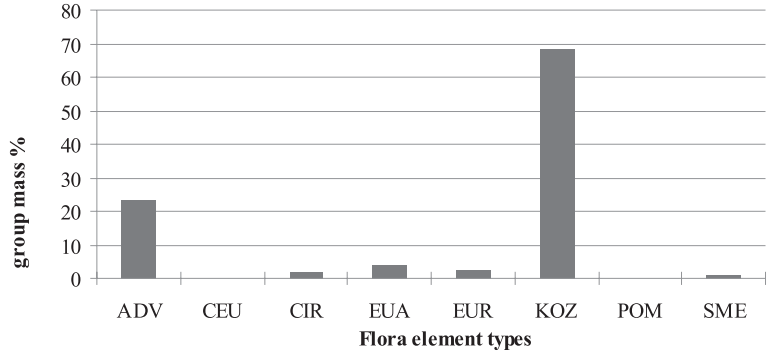

Fig. 2: The distribution of the flora element types according to group mass

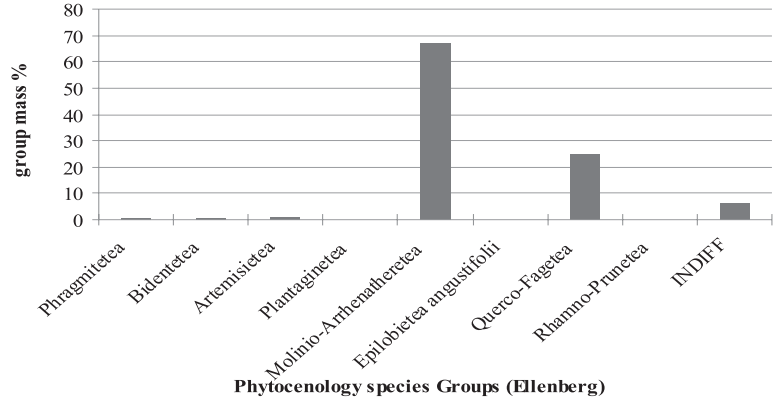

Fig. 3: The phytocenology species groups' distribution according to a mass percentage

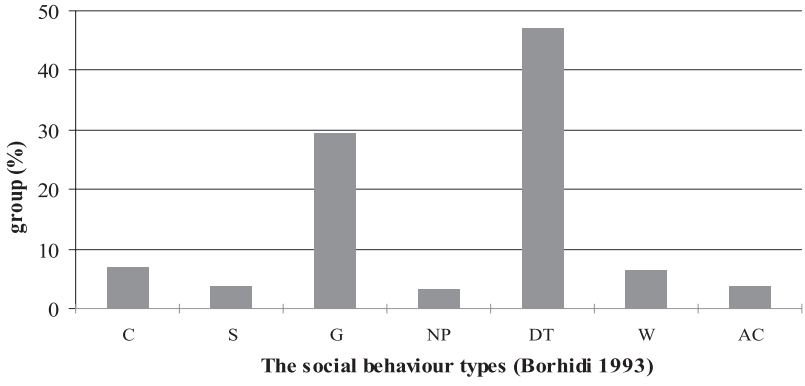

Fig 4: The distribution of social behavior types (by BORHIDI) according to a group share

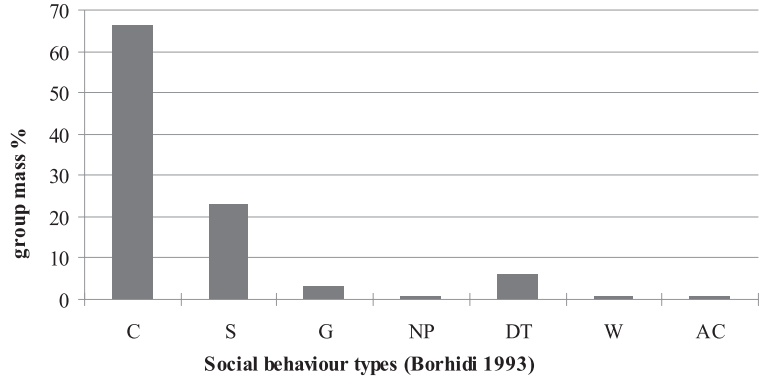

Fig. 5: The social behavior types according to group mass

we examine the group mass rate cosmopolitans' participation is 70% taking into consideration that the presence of adventives is also remarkable due to the dominant Inula helenium. The aggressive neophyte plants may effect as a possible danger to the association namely the low rate presence of *Ambrosia artemisiifolia* and the *Solidago gigantea* may increase significantly.

Phytosociological groups

Regarding their mass the *Molinio-Arrhenatheretea* class allocates the characteristic features of the association (Fig. 3). Beside them the resettling elements of the forests (*Querco-Fagetea*) from the edge appears.

Naturalness state

Among the social behaviour types the disturbance tolerant species (47%) and the generalist (29%) species dominate because of the half natural human activity (Fig. 4) which did not introduce many new species. Therefore ruderal species do not play an important

role, the natural competitors represent the good state of the association with 70% presence (Fig. 5). Beside them the special species show the value of the association with their 23% presence.

Summary

The newly characterized plant associations in South-Transdanubia can be found in Landscape protection area of Zselic. In this loess area in the South orientated narrow (20-25 m) valleys on black meadow-soils developed a forest-fringes association formed by tall and low forbs. There is no permanent water flow and even after heavy rain there is no water flow at its sites. Ten relevés were made in several valleys of the Zselic Hills between 23 September 1998 and 12 July 1999 both from the spring- and the late summer aspects with classical phytosociological methods according to the Zürich-Montpelleir school, using sampling plots of 10 × 10 m = 100 m^2 size, the 6th is taken as holotype. The name of the association is *Deschampsio caespitosae Inuletum helenii* Dávid. Their dominant species in the tall layer of 1.5–2 m height is *Inula helenium*, in the low layer: *Deschampsia caespitosa*. Further constant species of the association are: *Juncus effusus, Lycopus europaeus, Lysimachia nummularia* and *Mentha pulegium*. Basically the cosmopolitan plants dominate (70%) but unfortunately adventive neophytes, e.g. *Ambrosia artemisiifolia* and *Solidago gigantea* may endanger the stability of the composition. The wet and hay-meadow species (*Molinio-Arrhenatheretea*) characterize the community. The high participation of natural competitors (70%) shows a good state of the association.

References

BORHIDI, A. 1984: A Zselic erdei. - Dunántúli Dolgozatok Természettudományi Sorozat, Pécs pp. 1-145.

BORHIDI, A. 1993: A Magyar Flóra szociális Magatartás Típusai, Természetességi és Relatív Ökológiai Értékszámai. - Social Behaviour Types of the Hungarian Flora, its naturalness and relative ecological indicator values. - Janus Pannonius Tudományegyetem Kiadványai. Pécs, pp. 1-95.

BORHIDI, A. 2003: Magyarország növénytársulásai. - Akadémiai Kiadó. Budapest pp. 1-610.

ELLENBERG H., WEBER H. E., DÜLL R., WIRTH R. W., WERNER W. & PAULISSEN D. 1991: Zeigerwerte der Gefässpflanzen Mitteleuropas. - 2. Auflage Scripta Geobotanika 9: 122.

JUHÁSZ, M. 2008: Északi-Zselic. - In: KIRÁLY G. et al.: Magyarország kistájainak növényzete. MTA ÖBKI Vácrátót pp. 138.

MAROSI, S., SOMOGYI, S. 1990: Magyarország kistájainak katasztere II. - MTA Földrajztudományi Kutatóintézet Budapest pp. 584-588.