Characterization Phyto-Socio-Ecological of *Agrostis capillaris* L. Grasslands

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Abstract

Floristic composition of the pastures is a mirror action and practical factors applied station and management (maintenance and how to use). The purpose of this research is to assess the state of the biodiversity and pastoral value for *Agrostis capillaries* L. grasslands from the mountain area. Also, there has been analyzed the floristic composition and a series of ecological indexes, respectively humidity, soil reaction, temperature, and nitrogen. We examined how estimated species diversity patterns changed with varying survey intensity from Băișoara village, Cluj County, Romania, an *Agrostis capillaries* L. grasslands. The experiment was performed in 2015. The vegetation observations were made on 29 plots. In this descriptive plot been identified the type of grassland *Agrostis capillaries*, described in boreal at altitudes between 850 and 1200, generally starting on exhibitions east until the south (90° - 180 °). The floristic composition of the *Agrostis capillaries* grasslands from the studied area is influenced by the local conditions and the intensity of the exploitation, these surfaces being under-exploited.

Keywords: Băișoara village, ecology, grassland.

INTRODUCTION

In Baisoara village have been studied one grassland plots of 500 hectares. The purpose of this research is to assess the state of the biodiversity and pastoral value for *Agrostis capillaries* L. grasslands from the mountain area. Also, there has been analyzed the floristic composition and a series of ecological indexes, respectively humidity, soil reaction, temperature, and nitrogen. Other aspects taken into account were the agronomical and anthropogenic specters. The analyzed grasslands are placed in the perimeter of Băișoara village, from Cluj County.

The purpose of this research is to assess the state of the biodiversity and pastoral value for *Agrostis capillaries* L. grasslands from the mountain area. Also, there has been analyzed the floristic composition and a series of ecological indexes, respectively humidity, soil reaction, temperature and nitrogen. Other aspects taken into account were the agronomical and anthropogenic specters.

MATERIAL AND METHODS

In this study, we examined how estimated species diversity patterns changed with varying survey intensity from Băișoara village, Cluj County, Romania, on an *Agrostis capillaries* L. grasslands. The experiment was performed in 2015 (Fig. 1).

Fig. 1. Geographical location of the Baisoara village

The area shows a typical mountain climate, with altitudes between 850 and 1200 m above

sea level. It is characterized by a high variation of land use and too climatic conditions in the area and a fine-grained mosaic of different land uses, including substantial amounts of semi-natural vegetation with 5.2°C average temperature (Păcurar *et al*, 2014). The vegetation observations were made on 29 plots.

Data analysis. The floristic composition was interpreted using an improved Braun-Blanquet scale with subdivisions (Pacurar and Rotar, 2014). Requirements plants to environmental factors (temperature, soil moisture and soil reaction) have been materialized by values of indicator species (from 1-9) after Ellenberg (1952, 1992) updated (Pacurar and Rotar, 2014). Plant resistance to mechanical interference, such as mowing, grazing and crushed materialized by value indicator (from 1-9) after (Dierschke *et al.*, 2002), and the names of appropriate species depending on the category disturbance were taken after Pacurar and Rotar (2014). Based on data from spectrum it can calculate the average indicator of a phytocoenosis. This may be unweighted or weighted. Assigning a phytocoenosis feed is achieved at the expense calculated weighted average indicator value. Using descriptive statistics (Cristea *et al.* 2004) analyzes were performed which are divided into two categories: central tendency parameters and indicators of scattering data. In the central tendency, parameters included those processes provide a representative value (central) measured for the data stream. There are three estimators that can be used for this purpose: the mean, median, and module (<http://statisticasociala.tripod.com/parametri.htm>).

RESULTS AND DISCUSSIONS

In this descriptive plot was identified *Agrostis capillaries* type of grassland, which belongs to the series *Agrostis capillaries*, of characteristic areas which moderately humid habitats, wet soils, mesobasic, moderately acid, sometimes skeletal or poor humus (Tucra *et al.*, 1987).

In our case, *Agrostis capillaris* type, was described in boreal floor at altitudes between 850 and 1200, in general exhibitions starting from the eastern to the southern regions (90 ° - 180 °) on land with a slope about 10 degrees mean sometimes reaching up to a maximum inclination of 32 degrees (Tab. 1). Of the total proportion of the 50 releves this type was found in 29 locations,

representing 58% of grasslands studied. *Agrostis capillaris* type is exploited most often mixed (mowing and then grazing) as shown by the Garda in 2010. In this type, woody vegetation cover has an average of 5.75% (table 1), the amplitude data is high (max = 15% = 2% minimum), and cover the most common being 2% (Module = 2%). Stub presence in most cases absent entirely (module = 0%; median = 0%). The situation is similar in the case of rocks (mean = 0%, module = 0%; median = 0%) and stones (median = 0%, module = 0%; median = 0%). Fallow molehills have a presence, in generally 1.75% (mean = 2.6%; median = 1.5%). In this types is meet molehills without fallow, but with a small participation 0.8% (mean = 1%; module = 1%). Overall coverage herbaceous vegetation is averaging 79.79%, data distribution is one relatively normal (obliquity = -0.34%) and platikurtic (vaulting = -0.62; Annex 1).

The Poaceae family makes its presence felt in herbaceous cover with a 42.03% average participation (Tab. 1), data having a high amplitude (minimum = 0.5% and maximum = 27.5%). At Poaceae addition of the dominant species (*Agrostis capillaries*) with a large Adm, is present species *Holcus lanatus* with 8.26% and most frequent coverage value is 11.25%, Adm followed by *Anthoxanthum odoratum* with 2.73% having the frequency of covering 2.75%, and then *Festuca rubra* with an average of covering 1.29%.

Regarding the distribution of data on only three species, this is normal and symmetric (obliquity = -0.20; -1.87), except the species *Anthoxanthum odoratum*, which has a negative asymmetry (obliquity = 2.57) at Poaceae family other species with smaller presence. Among the species of the Poaceae family species are evident for this type of grassland following: *Agrostis capillaries*, *Anthoxanthum odoratum* and *Cynosurus cristatus* (K = V). Two common species are present (*Briza media* and *Holcus lanatus*, K = IV), and two indicator species *Festuca rubra* and *Phleum pratense* (K = III). Accompanying species are 2, and the other five species are random (K = I).

Regarding the participation of Cyperaceae and Juncaceae families in this type of meadow is found that have averaged coverage of 1.5%.

Fabaceae family participates in the floristic composition, with an average of 18.77%, recording a maximum of 17.5% of the species *Trifolium pratense*. Data collected on their participation

Tab. 1. Floristic composition of the type of grassland *Agrostis capillaris* and specific requirement of ecological, agronomic and anthropogenic (B - BioForm, T - temperature, U - humidity, R - soil reaction, N – nutrition, C - tolerance of mowing, P - tolerance of grazing, S - tolerance of crushed, VF - fodder value, H - hemerobie, UR - urbanophile, SO - sociological category)

Ecological Indexes				Agronomical indexes				Anthropogenic indexes				Stand conditions		$\overline{x}$											
												Altitude (m)	850-1200												
												Slope (°)	30.84												
												Exposition	S, S-V												
												Land use	grazing												
												Grassland type	Agrostis capillaries												
												General cover (%)	79.79												
												Wooden vegetation cover (%)	5.75												
												Stubs (%)	-												
												Rocks (%)	-												
												Stones (%)	-												
												Fallow molehills (%)	1.75												
												Fresh molehills (%)	0.8												
												Landslides (%)	6.75												
												Erosion (%)	1												
												Swamps (%)	-												
												SPECIES												Adm	K
												B	T	U	R	N	C	P	S	VF	SO	H	UR	POACEAE	42.03
HT	x	x	x	4	6	5	5	n	6	2 – 4	3	Agrostis capillaris L.	23.71	V											
HT	x	x	5	x	7	5	5	n	4	2 – 4	2	Anthoxanthum odoratum L. s. str.	2.73	V											
HT	x	x	x	3	4	4	4	n	5	2 – 3	2	Briza media L.	0.50	IV											
H	x	4	8	5	4	4	3	n	7	3 – 4	3	Bromus inermis Leyss.	0.50	I											
HT	5	5	x	4	7	7	7	n	7	2 – 3	2	Cynosurus cristatus L.	1.53	V											
HT	x	x	2	3	3	4	4	n	4	2 – 3	2	Deschampsia flexuosa (L.) Trin.	0.50	I											
HT	x	5	x	6	8	4	6	n	9	3 – 4	3	Dactylis glomerata L. s. str.	0.50	II											
HT	x	6	x	6	6	4	6	n	9	2 – 4	2	Festuca pratensis Huds. s. l.	0.50	I											
HT	x	5	x	x	9	7	6	n	7	5	3	Festuca rubra L.	1.29	III											
HT	5	4	x	4	6	4	4	n	6	2 – 3	2	Holcus lanatus L.	8.26	IV											
H	5	3	7	2				n	6			Phleum montanum K. Koch	0.50	I											
HT	x	5	x	6	8	6	6	n	9			Phleum pratense L. s. str.	0.50	III											
HT	x	5	x	x	9	8	8	n	8	3 – 5	3	Poa pratensis L. s. str.	0.50	II											
HT	x	x	x	6	7	5	4	n	7	3	2	Trisetum flavescens (L.) P. Beauv.	0.50	I											
												CYPERACEAE	1.5												
HT	4	x	4	4	4	5	5	n	4	2 – 3	1	Carex pallescens L.	0.50	II											
												Luzula luzulina	0.50	I											
HT	x	x	3	4	4	5	4	n	4	2 – 3	2	Luzula luzuloides (Lam.) Dandy & Wilm.	0.50	II											

FABACEAE													18.77	
HT	x	4	8	3	4	4	4	n	6	2 – 3	1	<i>Anthyllis vulneraria</i> L. s. l.	0.50	II
H	5	4	9	3	3	7		n	1	2 – 4	2	<i>Coronilla varia</i> L.	0.50	II
HT	x	4	7	4	6	4	4	n	7	2 – 4	3	<i>Lotus corniculatus</i> L.	1.76	V
H	6	3	9	3	5	2	2	n	7	2 – 4	2	<i>Medicago falcata</i> L. s. str.	0.50	I
TT	5	4	x	6	6	4	4	n	7	3 – 4	2	<i>Trifolium campestre</i> Schreb.	0.50	II
HT	5	6	7	6	7	4	4	n	8	3 – 4	2	<i>Trifolium hybridum</i> L.	0.50	III
HT	x	3	8	2	5	4	4	n	6	2 – 3	1	<i>Trifolium montanum</i> L.	3.71	II
<i>Trifolium panonicum</i> L.													0.50	III
HT	x	x	x	6	7	4	4	n	8	3 – 4	2	<i>Trifolium pratense</i> L.	7.52	V
ChRs	x	x	x	6	8	8	8	n	8	3 – 5	3	<i>Trifolium repens</i> L.	2.28	V
HA	x	5	x	6	6	1	2	n	6	3 – 4	2	<i>Vicia cracca</i> L. s. str.	0.50	II
OTHER FAMILIES BOTANICAL (AFB)													58.83	
HT	5	4	7	3	7	4	5	n	4			<i>Achillea distans</i> Waldst. & Kit. ex Willd.	1.50	II
ChRs	x	4	x	5	7	4	5	n	6	2 – 4	3	<i>Achillea millefolium</i> L.	1.38	IV
HRs	6	4	8	4	3	4	3	n	3	2 – 3	2	<i>Agrimonia eupatoria</i> L.	0.50	I
GRs	x	x	5	x	5	6	7	n	1	2 – 3	2	<i>Anemone nemorosa</i> L.	0.50	I
<i>Aposeris foetida</i>													0.50	I
HRs	4	5	3	2	4	4	4	4	4	2 – 3	1	<i>Arnica montana</i> L.	0.50	I
HRs	6	4	x	4	4	2	4	n	4	2 – 3	1	<i>Betonica officinalis</i> L.	0.80	III
ChLS	4	4	2	4	1	8	9	n	3	2	1	<i>Bruckenthalia spiculifolia</i> (Salisb.) Rchb.	0.50	I
ChLT	x	x	1	1	2	5	4	n	3	2 – 3	1	<i>Calluna vulgaris</i> (L.) Hull	0.50	I
<i>Campanula abietina</i> Griseb.													0.50	III
HRs	5	5	7	4	5	2	2	n	4	2 – 3	2	<i>Campanula patula</i> L.	0.50	IV
<i>Campanula persicifolia</i>													0.50	III
H	x	4	x	2	3	8	7	n	3	2 – 3	1	<i>Carlina acaulis</i> L.	0.50	II
HRs	4	5	x	6	6	6	6	n	6	3 – 4	1	<i>Carum carvi</i> L.	0.95	III
HRs	x	5	5	4	5	2	3	n	4	2 – 3	2	<i>Centaurea pseudophrygia</i> C. A. Mey.	3.65	IV
HT	x	5	x	5	8	4	4	n	4	3 – 5	3	<i>Cerastium holosteoides</i> Fr.	0.50	III
HRs	5	5	6	5	6	2	2	n	4	3 – 4	3	<i>Crepis biennis</i> L.	0.50	III
HRs	6	4	x	4	6	3	4	n	5	3 – 5	3	<i>Daucus carota</i> L.	0.50	III
HRs	5	4	7	2	3	4	4	n	4	2 – 3	2	<i>Dianthus carthusianorum</i> L.	0.50	I
TT	7	x	x	4	2	3	2	n	4	3 – 5	3	<i>Echium vulgare</i> L.	0.50	I
TRs	x	5	x	3	5	6	5	n	3	2 – 4	1	<i>Euphrasia rostkoviana</i> (Hayne) Towns.	0.50	III
HA	x	5	7	x	7	3	3	n	4	2 – 5	3	<i>Galium album</i> Mill.	1.06	III
HT	5	4	7	3	5	4	4	n	5	2 – 3	2	<i>Galium verum</i> L. s. str.	0.91	II
ChLT	5	x	4	2	3	5	4	n	3	2 – 3	1	<i>Genista tinctoria</i> L.	0.50	I
HT	x	5	2	2	3	2	2	4	4	3	1	<i>Gentiana asclepiadea</i> L.	0.50	I
HRs	x	6	3	2	3	3	3	n	4	2 – 3	1	<i>Hypericum maculatum</i> Crantz s. str.	0.50	II
HRs	x	4	x	x	3	4	4	n	1	2 – 6	3	<i>Hypericum perforatum</i> L.	0.50	I

HRs	5	6	6	6	4	2	2	n	4	2-3	1	<i>Knautia dipsacifolia</i> Kreutzer	0.50	I
												<i>Laserpitium latifolium</i> L.	0.50	II
HR	x	5	x	5	7	7	7	n	5	3-4	3	<i>Leontodon autumnalis</i> L.	0.50	II
H	x	4	x	3	6	3	4	n	5	3-4	2	<i>Leucanthemum vulgare</i> Lam. s. str.	2.48	IV
												<i>Myosotis sylvatica</i> Ehrh. ex Hoffm.	0.50	I
												<i>Origanum vulgare</i>	0.50	I
HRs	x	6	7	7	5	3	2	n	5	2-3	1	<i>Pimpinella major</i> (L.) Huds.	0.50	III
HR	x	x	x	x	7	6	6	n	6	2-4	3	<i>Plantago lanceolata</i> L.	0.50	IV
HR	x	4	8	3	4	8	8	n	5	2-4	2	<i>Plantago media</i> L.	0.50	III
HT	x	5	3	2	4	4	4	n	4	2-3	1	<i>Polygala vulgaris</i> L. s. l.	0.50	I
HT	x	x	x	2	3	4	5	n	5	2-3	1	<i>Potentilla erecta</i> (L.) Raeusch.	0.50	I
HS	x	x	4	x	9	8	8	n	4	3-4	2	<i>Prunella vulgaris</i> L.	0.50	IV
HRs	x	x	x	x	6	5	6	n	4	3-4	2	<i>Ranunculus acris</i> L.	0.50	III
												<i>Rhinanthus glaber</i> L.	7.67	I
TRs	x	x	x	3	5	8	3	n	3	2-3	1	<i>Rhinanthus minor</i> L.	9.45	II
HRs	x	x	x	x	6	4	2	n	4	3-4	2	<i>Rumex acetosa</i> L.	0.50	IV
												<i>Salvia officinalis</i>	0.50	IV
HRs	5	4	8	2	5	3	4	n	4	2-3	1	<i>Scabiosa columbaria</i> L.	0.74	IV
HRs	5	3	7	3	4	2	2	n	4	2-3	2	<i>Silene nutans</i> L.	0.50	I
HT	x	x	7	6	4	2	2	n	4	3-4	2	<i>Silene vulgaris</i> (Moench) Garcke s. l.	0.50	I
HS	x	4	4	x	4	5	5	n	1	2-4	2	<i>Stellaria graminea</i> L.	0.75	V
HR	x	5	x	6	8	7	7	n	7	3-5	3	<i>Taraxacum officinale</i> Weber s. l.	0.50	I
ChLS	x	2	5	6	4	6	6	n	3	2-3	2	<i>Thymus serpyllum</i> L.	0.50	II
HRs	5	4	7	6	6	2	2	n	5	3-4	2	<i>Tragopogon pratensis</i> L. s. l.	0.50	I
ChLS	x	x	2	3	1	8	9	n	3	2-3	2	<i>Vaccinium myrtillus</i> L.	0.50	I
ChLS	x	4	2	1	1	9	9	n	3	2-3	1	<i>Vaccinium vitis-idaea</i> L.	0.50	I
ChRs	x	4	x	6	7	6	6	n	4	2-4	2	<i>Veronica chamaedrys</i> L. s. str.	0.50	III
ChRs	x	4	2	6	4	4	4	n	4	2-3	1	<i>Veronica officinalis</i> L.	0.50	I
HT	5	x	x	6	4	2	2	n	4	2-3	1	<i>Viola canina</i> L. s. str.	0.50	I
HT	5	x	x	6	5	4	4	n	4	3-5	2	<i>Viola tricolor</i> L.	0.50	III

are Fabaceae-symmetric (obliquity = 0.98) and platykurtic distribution (vaulting = -1.10).

From Fabaceae species of the best participation has *Trifolium pratense* (7.52%) followed by the species *Trifolium montanum* (3.71%), other species with lower Adm. *Lotus corniculatus*, *Trifolium repens* and *Trifolium pratense* species are enlightening. Are not accompanying species, and some species are random (*Trifolium hybridum* and *Trifolium panonicum*). Plants from other botanical families (AFB) are present in phytocoenosis type *Agrostis capillaris* on average by 58.83%,

reaching a minimum of 9% and a maximum of 52.5%. Obtained data on the participation of plants from other botanical families (are symmetrical, positive (obliquity = 0.20) and platykurtic vaulting = - 0.164). Some species in this group have a significant Adm such as : *Rhinanthus minor* 9.45% to 7.67% *Rhinanthus glaber*, *Centaurea pseudophrygia* 3.65%, *Leucanthemum vulgare* 2.48% and *Galium album* with 1.06%. Some species have a lower participation, on average, from 0.74 to 0.95%, as species: *Scabiosa columbaria*, *Stellaria*

Tab. 2 Ecological and agronomical spectrum of *Agrostis capillaries* grassland type

Eclog. indexes 1	Ecological spectrum										VIMnp
	2	3	4	5	6	7	8	9	x	VIMp	
Unp	0.0	1.0	5.0	26.0	19.0	5.0	0.0	0.0	0.0	23	4.4
Up	0.0	0.5	6.0	33.6	15.5	2.5	0.0	0.0	0.0	54.69	4.2
Rnp	1.0	6.0	4.0	4.0	5.0	2.0	14.0	6.0	2.0	35.00	5.5
Rp	0.5	3.0	2.0	2.3	8.2	1.0	14.7	6.5	1.0	73.64	5.9
Nnp	2.0	11.0	13.0	14.0	5.0	22.0	1.0	0.0	0.0	11.00	4.2
Np	1.0	9.0	18.8	48.2	3.4	22.5	0.5	0.0	0.0	9.34	4.1
Agron. indexes 1	Agronomic spectrum										VIMnp
	2	3	4	5	6	7	8	9	x	VIMp	
Cnp	3.0	3.0	12.0	16.0	11.0	13.0	11.0	6.0	3.0	0.00	5.1
Cp	1.5	1.5	12.5	8.6	21.5	41.2	18.2	5.1	2.3	0.00	5.5
Pnp	1.0	11.0	8.0	25.0	9.0	8.0	6.0	8.0	1.0	0.00	4.6
Pp	0.5	9.0	8.8	34.0	30.2	9.0	5.1	14.7	0.5	0.00	4.9
Snp	0.0	13.0	6.0	25.0	8.0	10.0	7.0	5.0	3.0	0.00	4.7
Sp	0.0	6.5	15.7	34.7	31.6	10.7	6.8	4.3	1.5	0.00	4.6
VFnp	0.0	1.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0	3.6
VFp	0.0	0.5	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0	3.8
Legend											
U	humidity		C	mowing			VF	fodder value			
R	soil reaction		P	grazing			np	unweighted (depending on the number of species)			
N	nutrition		S	crushed			p	weighted (depending on species coverage)			

graminea, *Galium verum* and *Carum carvi*. Many species have a low participation, averaging 0.5%.

Only one edifying species is present of this type of grassland from AFB group plants which is *Stellaria graminea* (K = V). Common species (K = IV) are: *Achillea millefolium*, *Campanula patula*, *Centaurea pseudophrygia*, *Leucanthemum vulgare*, *Plantago lanceolata*, *Prunella vulgaris*, *Rumex acetosa* and *Scabiosa columbaria*.

Among the indicator species (K = III) encountered in this type of meadow include: *Betonica officinalis*, *Campanula abietina*, *Campanula persicifolia*, *Carum carvi*, *Cerastium holosteoides*, *Crepis biennis*, *Daucus carota*, *Euphrasia rostkoviana*, *Galium album*, *Pimpinella major*, *Plantago media*, *Ranunculus acris*, *Veronica chamaedrys* and *Viola tricolor*. There are 7 species accompanying and 26 species considered accidental.

From ecological point of view (ecological spectrum) phytocoenosis has a meso-xerophyllous

(Up = 4.2), moderate acidophilous (Rp = 5.9) and oligomezotrophic (Np = 4.1) characters.

The agronomical point of view (agronomical spectrum) phytocoenosis has medium character tolerant mowing (Cp = 5.5), is moderately tolerant grazing (Pp = 4.9) and moderately tolerant crushed (Sp = 4.6). The interpretation of agronomic factors, we can conclude that the grasslands are used in a semi-extensive mode, the plants are trampled frequently in grazing period (Tab. 2).

Thus, the feed value of *Agrostis capillaries* grassland type is 3.8 (VFP = 3.8), so meadow covered by Class IV category of mediocre pasture and supports from 0.41 to 0.60 LU / ha.

The agronomical point of view in phytocoenosis, type has not the toxic species only a damaging species of animal products. Phytocoenosis presents coverage of 4.3% with poor forage species (ballast). Average or good forage species missing from the grassy coverage.

CONCLUSIONS

Interpretation of agronomic factors we can conclude that the grasslands are used in a semi-extensive mode, these surfaces being under-exploited.

Thus, the feed value of *Agrostis capillaris* grassland type is 3.8 (VFP = 3.8), so meadow covered by Class IV category of mediocre pasture and supports from 0.41 to 0.60 LU / ha.

The average data from 29 plots of results that *Agrostis capillaris* it has a range between 17.50 and 27.50%. The Fabaceae family have coverage between 5 and 19%.

The floristic composition of the *Agrostis capillaris* grasslands from the studied area is influenced by the local conditions and the intensity of the exploitation, these surfaces being under-exploited.

We also are militating for a properly grazing system and minimal maintenance works.

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Annex 1. Statistic processing of data regarding stand conditions, species composition of *Agrostis capillaris* L. type and the species' frequency constancy in relevees

Species	Average	Stdev	CV	Median	Mode	Skew	Kurt	Min	Max	Count	K
POACEAE											
<i>Agrostis capillaris</i> L.	23.71	4.94	0.21	27.50	27.50	-0.53	-1.86	17.50	27.50	29.00	V
<i>Anthoxanthum odoratum</i> L. s. str.	2.73	2.73	1.00	2.75	2.75	2.57	7.13	0.50	11.50	27.00	V
<i>Briza media</i> L.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	18.00	IV
<i>Bromus inermis</i> Leyss.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	3.00	I
<i>Cynosurus cristatus</i> L.	1.53	1.15	0.75	0.50	0.50	0.18	-2.16	0.50	2.75	24.00	V
<i>Deschampsia flexuosa</i> (L.) Trin.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	5.00	I
<i>Dactylis glomerata</i> L. s. str.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	11.00	II
<i>Festuca pratensis</i> Huds. s. l.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	2.00	I
<i>Festuca rubra</i> L.	1.29	1.77	1.37	0.50	0.50	1.87	1.67	0.50	5.00	17.00	III
<i>Holcus lanatus</i> L.	8.26	5.81	0.70	11.25	11.25	-0.20	-1.13	0.50	17.50	18.00	IV
<i>Phleum montanum</i> K. Koch	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	5.00	I
<i>Phleum pratense</i> L. s. str.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	12.00	III
<i>Poa pratensis</i> L. s. str.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	7.00	II
<i>Trisetum flavescens</i> (L.) P. Beauv.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	3.00	I
CYPERACEAE											
<i>Carex pallescens</i> L.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	9.00	II
<i>Luzula luzulina</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	5.00	I
<i>Luzula luzuloides</i> (Lam.) Dandy & Wilm.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	7.00	II

FABACEAE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	I
<i>Anthyllis vulneraria L. s. l.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	7.00	II
<i>Coronilla varia L.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	10.00	II
<i>Lotus corniculatus L.</i>	1.76	1.73	0.98	0.50	0.50	0.98	-0.51	0.50	5.00	25.00	V
<i>Medicago falcata L. s. str.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	4.00	I
<i>Trifolium campestre Schreb.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	8.00	II
<i>Trifolium hybridum L.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	12.00	III
<i>Trifolium montanum L.</i>	3.71	2.20	0.59	5.00	5.00	-1.23	-0.84	0.50	5.00	7.00	II
<i>Trifolium panonicum L.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	12.00	III
<i>Trifolium pratense L.</i>	7.52	4.92	0.65	5.00	11.25	0.31	-0.99	0.50	17.50	29.00	V
<i>Trifolium repens L.</i>	2.28	1.99	0.87	1.63	0.50	0.44	-1.62	0.50	5.00	24.00	V
<i>Vicia cracca L. s. str.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	10.00	II
OTHER FAMILIES BOTANICAL (AFB)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	I
<i>Achillea distans Waldst. & Kit. ex Willd.</i>	1.50	1.19	0.79	0.50	0.50	0.27	-2.57	0.50	2.75	9.00	II
<i>Achillea millefolium L.</i>	1.38	1.13	0.82	0.50	0.50	0.50	-1.99	0.50	2.75	18.00	IV
<i>Agrimonia eupatoria L.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	3.00	I
<i>Anemone nemorosa L.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	2.00	I
<i>Aposeris foetida</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	2.00	I
<i>Arnica montana L.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	5.00	I
<i>Betonica officinalis L.</i>	0.80	0.79	0.99	0.50	0.50	2.40	4.35	0.50	2.75	15.00	III
<i>Brachypodium pinnatum (L.) P. Beauv.</i>	5.00	0.00	0.00	5.00	5.00	0.00	0.00	5.00	5.00	5.00	I
<i>Bruckenthalia spiculifolia (Salisb.) Rchb.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	5.00	I
<i>Calluna vulgaris (L.) Hull</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	5.00	I
<i>Campanula abietina Griseb.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	12.00	III
<i>Campanula patula L.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	20.00	IV
<i>Campanula persicifolia</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	17.00	III
<i>Carlina acaulis L.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	11.00	II
<i>Carum carvi L.</i>	0.95	0.93	0.98	0.50	0.50	1.67	0.90	0.50	2.75	15.00	III
<i>Centaurea pseudophrygia C. A. Mey.</i>	3.65	1.53	0.42	3.88	5.00	-0.71	-0.45	0.50	5.00	20.00	IV
<i>Cerastium holosteoides Fr.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	13.00	III
<i>Crepis biennis L.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	13.00	III
<i>Daucus carota L.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	13.00	III
<i>Dianthus carthusianorum L.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	3.00	I
<i>Echium vulgare L.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	5.00	I
<i>Euphrasia rostkoviana (Hayne) Towns.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	13.00	III
<i>Galium album Mill.</i>	1.06	1.54	1.45	0.50	0.50	2.51	4.90	0.50	5.00	16.00	III
<i>Galium verum L. s. str.</i>	0.91	0.91	1.00	0.50	0.50	1.92	2.04	0.50	2.75	11.00	II
<i>Genista tinctoria L.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	3.00	I
<i>Gentiana asclepiadea L.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	5.00	I
<i>Hypericum maculatum Crantz s. str.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	10.00	II
<i>Hypericum perforatum L.</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	3.00	I

<i>Knautia dipsacifolia</i> Kreutzer	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	2.00	I
<i>Laserpitium latifolium</i> L.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	9.00	II
<i>Leontodon autumnalis</i> L.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	10.00	II
<i>Leucanthemum vulgare</i> Lam. s. str.	2.48	3.19	1.29	1.63	0.50	2.29	4.82	0.50	11.25	20.00	IV
<i>Myosotis sylvatica</i> Ehrh. ex Hoffm.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	3.00	I
<i>Origanum vulgare</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	6.00	I
<i>Pimpinella major</i> (L.) Huds.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	15.00	III
<i>Plantago lanceolata</i> L.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	18.00	IV
<i>Plantago media</i> L.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	16.00	III
<i>Polygala vulgaris</i> L. s. l.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	5.00	I
<i>Potentilla erecta</i> (L.) Raeusch.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	5.00	I
<i>Prunella vulgaris</i> L.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	18.00	IV
<i>Ranunculus acris</i> L.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	14.00	III
<i>Rhinanthus glaber</i> L.	7.67	5.55	0.72	11.25	11.25	-0.97	-1.88	0.50	11.25	6.00	I
<i>Rhinanthus minor</i> L.	9.45	8.53	0.90	10.13	17.50	-0.03	-2.51	0.50	17.50	10.00	II
<i>Rumex acetosa</i> L.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	20.00	IV
<i>Salvia officinalis</i>	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	21.00	IV
<i>Scabiosa columbaria</i> L.	0.74	0.71	0.96	0.50	0.50	2.80	6.51	0.50	2.75	19.00	IV
<i>Silene nutans</i> L.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	4.00	I
<i>Silene vulgaris</i> (Moench) Garcke s. l.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	5.00	I
<i>Stellaria graminea</i> L.	0.75	0.72	0.96	0.50	0.50	2.62	5.27	0.50	2.75	27.00	V
<i>Taraxacum officinale</i> Weber s. l.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	2.00	I
<i>Thymus serpyllum</i> L.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	10.00	II
<i>Tragopogon pratensis</i> L. s. l.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	7.00	I
<i>Vaccinium myrtillus</i> L.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	5.00	I
<i>Vaccinium vitis-idaea</i> L.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	5.00	I
<i>Veronica chamaedrys</i> L. s. str.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	15.00	III
<i>Veronica officinalis</i> L.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	5.00	I
<i>Viola canina</i> L. s. str.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	5.00	I
<i>Viola tricolor</i> L.	0.50	0.00	0.00	0.50	0.50	0.00	0.00	0.50	0.50	17.00	III