

Ctenidio molluscae-Seslerietum uliginosae Klika 1943 em. Głazek 1983 — a new association for Poland

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Abstract

Paper presents ecological and phytosociological relationships of *Ctenidio molluscae-Seslerietum uliginosae* (*Caricion davallianae* alliance) — association new-distinguished for Poland. Its phytocoenoses occur in the eutrophic habitats within Kielce county and such mezoregiones as Świętokrzyskie Mountains, Szydłowskie Highlands, Pińczowski Hump and Nida Valley. The association was compared with the analogous one from Czechoslovakia. It was also proved to be well floristicly and ecologically stabilized.

Key words: association, phytosociology, fen community, classification

INTRODUCTION

The fen phytocoenoses with *Sesleria uliginosa* as a dominant, *Carex davalliana* as a constant component and well formed moss layer are quite often within Kielce county. Their physiognomy resembles wet meadows. They occupy large areas at eutrophic and wet sites within the mezoregiones of Świętokrzyskie Mountains, Szydłowskie Highalands, Pińczowski Hump and Nida Valley.

This type of phytocoenoses is unusually rare in the vegetation of Poland. The fact they were found only in West Pomerania (Czubiński 1950) and along lower Nida (Medwecka-Kornaś 1959, Kostrowicki 1966) indicates that. Outside Poland wet meadows with *Sesleria uliginosa* occur in south Sweden, USSR (Latvia, Estonia and Belorussia) Czechoslovakia, Austria, Hungary and in the other countries of the Balkan peninsula (Deyl 1946, Kac 1975).

The author thinks these phytocoenoses are worth to be studied in details as they are rare within Poland, the community range is very

wide, its floristic composition interesting, they are confined to particular habitats and they have not been studied in detail so far.

METHODS

Field studies were conducted in 1979-1983. First the patches with *Sesleria uliginosa* were found and then the phytosociological records were done using Braun-Blanquet's method (1951, Pawłowski 1972).

Moreover, the soil was studied and water table determined to define ecological characteristics of the habitat. Soil samples were collected in 1983. The laboratory analyses were made in the District Chemical-Agricultural Station in Kielce. The following parameters were studied:

- a) soil texture — by Cassagrande's method modified by Prószyński;
- b) pH in H_2O and 1N KCl — potentiometricly by means of glass and calomel electrodes;
- c) available K_2O and P_2O_5 contents — photometricly by Egner-Rhiem's method, while MgO colorimetricly by Schachtschabel's method;
- d) $CaCO_3$ content — by Scheibler method;
- e) total CaO and Na_2O contents — photometricly by means of flame photometer;
- f) total N content — by Kjeldahl's method;
- g) organic matter content was determined through combustion of samples in the electric furnace at $500^\circ C$.

In the phytosociological tables all the vascular plants were named according to "Rośliny polskie" (Szafer et al. 1953), while mosses according to Szafran (1957, 1961).

A systematic value of syntaxonomic groups, which composed the community was calculated using Tüxen's and Ellenberg's method (c. Pawłowski 1972).

RESULTS AND DISCUSSION

Within the study area *Ctenidio molluscae-Seslerietum uliginosae* patches occur under specific ecological and morphological conditions of the site. They appear in the valleys of rivers and other water courses, but only there where rivers cut through lime or gypsum hills, or are in a close contact with their ridges. They are also sometimes found in the depressions between lime and gypsum rise ridges. Their habitats are often flooded with thaw water, rapid falls runnig-off from the higher areas, or flowing water of the rising rivers and other water courses. These waters are usually rich in oxygen, mineral salts and calcium.

White CaCO_3 sediments around the plants when surface water retreats indicate that. Under such ecological conditions organic-mineral soils are formed. In the respect of typology they belong to the subtype of peat soils, fen soils and gleyed peat-muck soils. The soil analysis was based on three profiles (Fig. 1). The soils are slightly acid or neutral, rich in P_2O_5 , K_2O and MgO , very rich in CaO , Na_2O and organic N (Table 2). The following horizons were distinguished in the profiles studied: Ao - Atn - AmD - D_1 Gr- D_2 Gr; Ao - $\text{Atn}+\text{m}$ - DGr ; Ao - $\text{Atn}+\text{m}$ - AmD - D_1 - D_2 Go

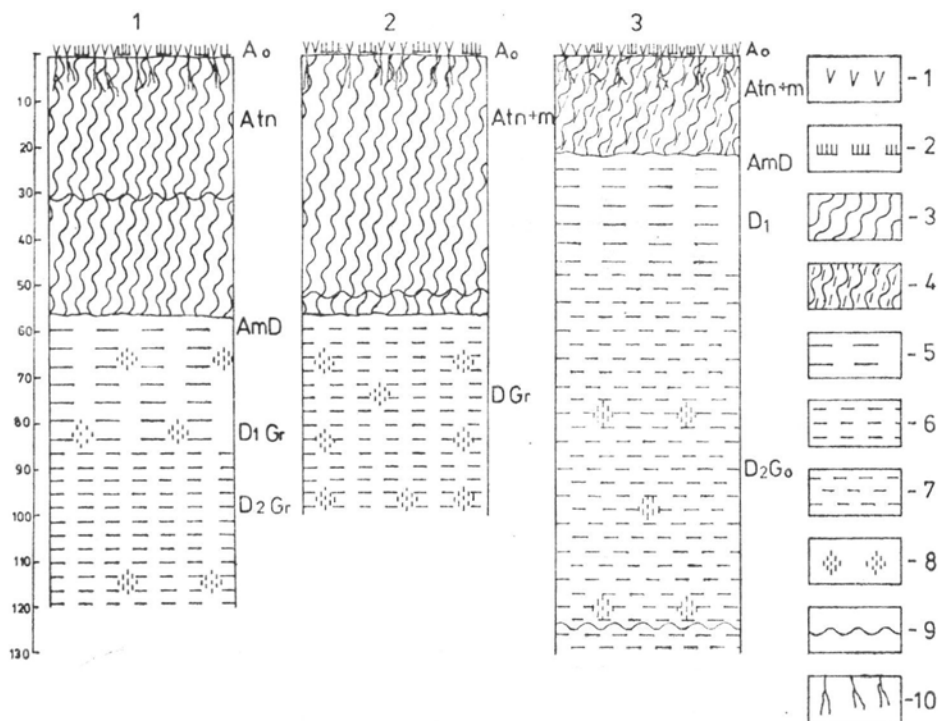


Fig. 1. Soil profiles of the *Ctenidio molluscae-Seslerietum uliginosae*
 1 — herb debris; 2 — moss debris; 3 — fen peat; 4 — peat-muck soil; 5 — coarse sandy soil; 6 — loose sandy soil; 7 — silty loose sandy soil; 8 — gleization; 9 — ground water table; 10 — roots of herbaceous plants. Symbols (Ao , Atn) are used according to those in the systematics of Polish soils

(Fig. 1). Humus horizon was 22-56 cm deep and organic matter content there ranged from 27.6 to 80.2%. It is usually peat or peat-muck soil. Water table in the excavations studied was 31-124 cm deep.

The wet meadows with *Sesleria uliginosa* at the feet of gypsum hills near Busko (described on the basis of 3 phytosociological records by Medweddecka-Kornaś 1959) and in Nida valley (roughly described by Kostrowicki 1966) are formed under similar ecological conditions.

Table 1
Mechanical composition of soils in the patches of *Ctenidio molluscae-Seslerietum uliginosae*

No. of profile	Depth of horizon, cm	Soil skeleton, %	Content of fractions, %							Textural group
			1-0.1 mm	0.1-0.05 mm	0.05-0.02 mm	0.02-0.005 mm	0.005-0.002 mm	0.002 mm	< 0.02 mm	
1	0- 30	—	—	—	—	—	—	—	—	fen peat
	30- 56	—	—	—	—	—	—	—	—	fen peat
	56- 81	0	85	5	3	1	1	5	7	coarse sandy soil
	83-118	0.7	96	2	1	1	0	0	1	loose sandy soil
2	0- 56	—	—	—	—	—	—	—	—	peat-muck soil
	56-100	0	97	2	1	0	0	0	0	loose sandy soil
3	0- 22	—	—	—	—	—	—	—	—	peat-muck soil
	22- 45	0.5	76	9	7	3	3	2	8	coarse sandy soil
	45-100	0.4	66	17	12	3	0	2	5	silty loose sandy soil
	100-130	1.3	67	23	6	3	0	1	4	silty loose sandy soil

Table 2

Some chemical properties of soils in the patches *Ctenidio molluscae-Seslerietum uliginosae*

No. of profile	Depth of horizon, cm	pH		CaCO ₃ , %	P ₂ O ₅	K ₂ O	MgO	CaO	Na ₂ O	N total, %	Loss by glowing at the temp. 500°C
		H ₂ O	KCl		mg per 100 g of soil			mg · dm ⁻³ of dry soil			
1	0- 30	7.0	6.7	0.4	1.7	3.0	43.1	4004	41.6	1.77	80.2
	30- 56	6.4	5.9	0	1.2	0.5	68.8	1792	22.3	1.21	53.0
	56- 81	6.4	6.0	0	2.1	0.5	48.4	1792	23.7	0.44	15.0
	83-118	6.8	6.3	0	1.7	0.5	4.8	392	5.9	0.01	—
2	0- 56	6.7	6.5	0	3.6	2.5	8.3	2800	29.7	0.78	27.9
	56-100	7.1	6.8	0	1.2	0.5	0.8	420	5.9	0.02	
3	0- 22	6.2	5.7	0	1.2	1.5	34.8	1652	26.7	0.83	27.6
	22- 45	6.5	5.9	0	0.5	0.5	9.4	1120	10.4	0.07	
	45-100	6.7	6.0	0	0.6	1.0	5.5	420	7.4	0.02	
	100-130	7.2	6.3	0	1.3	1.5	6.8	392	4.5	0	

The patches of *Ctenidio molluscae-Seslerietum uliginosae* are big (several scores of areas or more) with the compact herb layer and varied mosscover. The community is easy to distinguish in the field, because of its physiognomy. Compact low green cover is composed mainly of *Sesleria uliginosa* with noticeable blue leaves and dense tussocks of *Carex davalliana* and differs from the neighbour phytocoenoses.

20 records in Table 3 show floristic composition of the community. On this basis the statement can be formed that this phytosociological unit is well ecologically and floristically stabilized and refers to similar phytocoenoses in Czechoslovakia (Zlatník 1928, Klika 1943, 1946, 1955) and Hungary (Zólyomi 1934). The detailed analysis has enabled the author to distinguish association new for Poland — named *Ctenidio molluscae-Seslerietum uliginosae*. Its character species are *Sesleria uliginosa*, *Polygala amarella*, *Ctenidium molluscum*. They are very constant and their coefficients of cover very high (Table 3). Phytosociological structure of the community places it in the group of fens of the *Caricion davallianae* alliance. Character species of *Caricion davallianae* alliance ($D = 16.8$) and *Scheuchzerio-Caricetea fuscae* class ($D = 6.6$) play the main role among specified syntaxonomic groups. The participation of the other groups such as *Calthion*, *Molinion*, *Molinietalia* ($D = 6.2$) and *Molinio-Arrhenatheretea* class ($D = 4.8$) is distinctly lower (Table 4).

Table 4

Systematic structure of *Ctenidio molluscae-Seslerietum uliginosae*

Group of species	z	Σg	G	C	D
<i>Caricion davallianae</i>	11	157	21.4	78.5	16.8
<i>Scheuchzerio-Caricetea fuscae</i>	6	76	10.4	63.3	6.6
<i>Calthion</i> <i>Molinion</i> <i>Molinietalia</i>	23	144	19.7	31.3	6.2
<i>Molinio-Arrhenatheretea</i>	26	135	18.4	26.0	4.8
Accompanying species	30	220	31.0	37.7	11.0
Total	96	732			

z — number of species, Σg — the sum of species appearances, G — group contribution, C — constancy, D — systematic value.

In the study area association is diversified in respect of its floristic composition and ecology. Thus, three variants have been distinguished: a) typical in the habitats where the water conditions are undisturbed, b) one with *Tetragonolobus siliculosus* and sub-variant with *Schoenus ferrugineus* at sites where the salt-content in the soil is slightly higher

Table 3
Ctenidio molluscae-Seslerietum uliginosae Klika 1943 em. Glazek 1983

Record number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Constancy	Coefficient of cover of the given species			
Date	20 V 1983					29 V 1983					26 VII 1983					7 VIII 1983		27 V 1983		12 VIII 1983			5 V 1979		
Locality	Radomice					Podleże					Mikułowice					Chwałowice		Czerwona Góra		Domaszowice					
Cover of herb layer in %	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100					
Cover of moss layer in %	80	90	95	95	90	30	80	100	100	100	100	65	100	100	55	100	5	50	50	50					
Area of the record in m ²	100	100	100	100	100	100	100	100	50	50	50	50	50	50	50	50	50	50	100	100					
Number of species in the record	31	37	38	42	29	50	36	34	37	36	37	44	40	41	39	43	38	29	24	26					
Variant	typical					Tetragonolobus siliquosus										dried slightly									
Ch. Ctenidio molluscae-Seslerietum uliginosae:																									
Sesleria uliginosa	4.4	4.5	4.5	4.5	3.4	4.5	4.5	4.5	4.5	3.4	2.3	2.3	4.5	3.4	2.3	2.3	2.3	3.4	3.4	3.4	V ²⁻⁴	4375			
Carex hostiana	1.1	1.1	+	+	1.1	/+/-	+	1.1	1.1	1.1	1.1	2.2	1.2	1.2	+	1.2	+	+	+	+	IV ²⁻²	428			
Polygala amarella	2.2	2.2	2.3	2.3	2.2	+	+	+	+	1.1	1.2	+	1.2	1.2	+	+	+	+	+	+	IV ²⁻²	541			
Ctenidium molluscum d	2.3	3.4	3.4	3.4	3.4	+	1.2	1.2	1.2	2.3	2.3	2.3	2.3	2.3	+	+	+	+	+	+	IV ²⁻³	1351			
Diff. species of the variant with Tetragonolobus siliquosus:																									
Tetragonolobus siliquosus	+	+	+	+	+	/+/-	1.2	/+/-	1.2	1.2	2.3	+	1.1	1.1	+	+	+	+	+	+	III ²⁻²	214			
Carex glauca	+	+	+	+	+	+	1.1	/+/-	1.1	1.1	2.3	2.3	2.2	2.2	+	2.2	2.2	+	+	+	III ²⁻²	601			
Trifolium montanum	+	+	+	+	+	+	+	+	1.1	+	1.1	+	+	+	+	+	+	+	+	+	II ²⁻¹	52			
Diff. species of the subvariant with Schoenus ferrugineus:																									
Schoenus ferrugineus	+	+	+	+	+	+	+	+	+	+	+	+	2.3	2.3	+	+	+	+	+	+	I ²	175			
Serratula tinctoria	+	+	+	+	+	+	+	+	+	+	+	+	1.1	1.1	+	+	+	+	+	+	I ¹	50			
Scorzonera humilis	+	+	+	+	+	+	+	+	+	+	+	+	1.1	1.1	+	+	+	+	+	+	I ¹	50			
Ch. Caricion davallianae:																									
Campylium stellatum d	1.2	1.2	+	+	+	1.2	+	+	1.2	1.2	+	+	1.2	1.2	+	+	+	+	+	+	V ²⁻¹	182			
Carex davalliana	3.4	3.4	2.3	2.3	3.4	2.3	1.2	2.3	2.3	3.4	3.4	3.4	3.4	3.4	3.4	2.3	3.4	1.2	1.2	1.2	V ¹⁻³	2500			
Eriophorum latifolium	2.2	1.1	1.1	1.1	2.3	+	1.1	+	2.2	2.2	1.2	1.1	1.2	1.2	1.1	1.1	+	/+/-	/+/-	/+/-	V ²⁻²	578			
Parnassia palustris	1.2	1.1	1.1	1.1	1.1	+	+	+	1.1	1.2	1.2	1.1	2.3	2.2	+	1.2	1.2	+	/+/-	/+/-	V ²⁻²	454			
Epipactis palustris	1.1	1.1	+	+	1.1	+	+	+	/+/-	+	2.2	/+/-	+	+	+	2.3	+	+	+	+	IV ²⁻²	254			
Orchis latifolia	+	1.1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	IV ²⁻¹	31			
Carex flava	1.1	2.3	+	+	+	+	+	1.2	+	+	+	+	+	+	+	1.1	/+/-	2.2	2.2	1.1	III ²⁻²	365			
Valeriana simplicifolia	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	1.2	+	+	+	+	I ¹	25			
Ch. Scheuchzerio - Caricetea fuscae:																									
Carex panicea	2.3	2.3	1.1	1.2	2.3	1.2	2.3	2.2	2.2	2.2	2.3	2.3	2.3	1.1	1.2	1.2	1.2	2.2	2.2	2.2	V ¹⁻²	1315			
Carex fusca	+	1.1	1.2	1.1	1.1	+	1.1	1.2	1.1	1.1	+	+	+	+	+	+	1.1	1.1	1.1	1.1	V ²⁻¹	303			
Drepanocladus revolvens d	+	1.2	1.2	1.2	1.2	1.2	1.2	3.4	+	4.5	3.4	1.2	3.4	3.4	+	4.4	+	+	+	+	IV ²⁻⁴	1552			
Valeriana dioica	1.1	1.1	2.3	+	1.1	1.2	1.1	1.1	+	+	+	+	2.2	+	+	+	2.2	1.1	+	1.1	III ²⁻²	463			
Camptothecium nitens d	+	+	+	+	+	+	+	+	+	+	+	+	1.2	1.2	+	+	+	+	+	+	III ²⁻¹	54			
Pedicularis palustris	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	I ²	1			
Ch. Calthion, Molinion, Molinietaalia																									
Equisetum palustre	2.2	1.2	1.1	1.2	1.2	+	1.1	1.1	1.2	1.1	1.1	1.1	1.1	1.1	1.1	2.3	1.2	2.2	3.3	3.3	V ²⁻³	988			
Cirsium rivulare	2.3	2.3	1.1	1.1	2.2	+	+	1.2	2.3	2.3	1.1	1.2	1.1	1.1	1.1	+	2.3	2.3	+	1.2	IV ²⁻²	876			
Galium uliginosum	+	+	+	1.1	+	+	+	+	1.1	+	1.1	+	+	+	+	1.1	2.2	+	+	+	IV ²⁻¹	228			
Succisa pratensis	+	1.1	+	1.1	+	+	+	1.1	+	1.1	+	+	+	+	+	+	+	1.1	1.1	1.1	IV ²⁻²	217			
Caltha palustris	+	1.1	+	+	+	+	+	1.1	+	+	+	+	+	+	+	+	+	1.1	1.1	1.1	III ²⁻¹	128			
Molinia coerulea	+	+	1.1	1.1	1.1	+	+	+	+	+	+	+	+	+	+	1.1	+	+	+	+	II ²⁻¹	79			
Crepis paludosa	+	+	1.1	1.1	1.1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	II ²	101			
Juncus articulatus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	II ²⁻¹	4			
Deschampsia caespitosa	+	+	+	+	+	+	+	1.2	+	+	+	+	+	+	+	+	+	+	+	+	II ²⁻¹	28			
Lychnis flos - cuculi	+	+	1.2	1.1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	II ²⁻¹	52			
Salix rosmarinifolia	+	+	+	+	+	+	+	+	+	+	+	1.2	+	+	1.1	1.2	1.1	+	+	+	II ²⁻¹	101			
Sporadic species:																									
Angelica silvestris 16/+; Cirsium palustre 6/1.1,7/1.1,8/1.1; Climacium dendroides d 3/+; 4/1.1; Galium boreale 2/+; 3/1.2,4/2.3; Lythrum salicaria 16/1.1; Sanguisorba officinalis 6/+; 12/1.2,15/1.1; Selinum carvifolia 17/1.1; Scirpus silvaticus 11/1.1,12/+; Taraxacum palustre 2/+; 15/+; 18/+;																									
Ch. Molinio - Arrhenatheretea:																									
Ranunculus acer	+	1.1	2.2	2.2	2.2	1.2	1.2	1.1	1.1	1.1	+	1.1	1.1	1.1	1.1	1.1	+	+	+	1.1	V ²⁻²	565			
Prunella vulgaris	+	1.1	+	1.1	+	+	+	+	+	1.1	1.1	1.1	1.1	1.1	+	1.2	1.1	1.1	1.1	+	IV ²⁻¹	277			
Centaurea jacea	+	1.1	+	+	+	+	+	1.1	1.1	1.1	+	1.1	+	+	+	+	2.2	+	+	+	IV ²⁻²	216			
Briza media	+	+	+	+	+	+	+	+	+	+	+	+	1.1	+	1.1	+	+	+	+	+	III ²⁻¹	55			
Plantago lanceolata	+	+	+	+	+	+	+	+	+	+	+	+	1.1	1.1	+	+	+	+	+	+	III ²⁻¹	55			
Cardamine pratensis	+	+	1.1	+	+	+	+	+	+	+	+	+	+	+	+	1.1	+	+	+	+	II ²⁻¹	53			
Leontodon hispidus	+	+	+	+	+	+	1.1	+	+	+	+	+	+	+	+	+	+	+	+	+	II ²⁻¹	28			
Lotus corniculatus	+	+	+	+	+	+	+	+	1.1	+	1.1	+	+	+	+	+	+	+	+	+	II ²⁻¹	53			
Trifolium pratense	+	+	+	+	+	+	1.1	+	+	+	+	+	+	+	+	+	1.1	+	+	+	II ²⁻¹	52			
Achillea millefolium	+	+	+	+	+	1.1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	II ²⁻¹	27			
Vicia cracca	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	1.1	1.2	+	+	+	II ²⁻¹	52			
Sporadic species:																									
Alchemilla acutiloba 4/+; Alectorolophus glaber 1/+; 2/+; Avenastrum pubescens 6/+; Chrysanthemum leucanthemum 1/+; 4/+; 11/+; 7 Cerastium vulgatum 3/+; 4/+; Euphrasia rostkoviana 9/1.1,11/1.1,14/+; Festuca pratensis 6/+; Galium mollugo 7/+; Geum rivale 15/1.1,16/1.1; Holcus lanatus 6/+; 18/+; Knautia pratensis 12/+; Lathyrus pratensis 9/+; 12/+; 16/+; 17/+; Poa pratensis 3/1.1,6/1.2,8/1.1; Rumex acetosa 4/+; 6/+; Trifolium dubium 4/+;																									
Accompanying species:																									
Calliergon cuspidatum d	4.5	4.5	4.5	4.5	4.5	3.4	4.5	4.5	4.5	2.3	4.5	4.5	4.5	4.5	4.5	2.3	+	3.4	3.4	3.4	V ²⁻⁴	4988			
Potentilla erecta	2.3	2.2	2.3	2.3	2.3	3.4	1.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	1.1	1.2	1.1	+	+	+	V ²⁻³	1339			
Fissidens adiantoides d	1.2	1.2	1.2	1.2	1.2	+	+	1.2	+	2.3	2.3	1.2	2.3	1.2	+	+	+	+	+	+	V ²⁻²	466			
Phragmites communis	2.2	2.2	+	+	1.1	+	+	+	1.1	1.1	1.1	+	+	+	+	+	+	+	+	+	III ²⁻²	278			
Heleocharis palustris	+	+	+	+	+	+	+	+	+	1.1	+	+	1.2	1.3	+	+	+	1.1	1.1	1.1	III ²⁻¹	153			
Linum catharticum	+	+	+	+	+	+	+	+	+	1.1	1.1	+	+	1.2	1.1	+	+	+	+	+	III ²⁻¹	103			
Mentha arvensis	+	+	+	+	+	1.1	1.1	+	+	+	+	+	+	+	+	+	+	+	+	+	III ²⁻¹	54			
Galium verum	+	+	2.2	2.2	1.1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	III ²⁻²	203			
Thuidium philiberti d	+	+	+	+	+	+	+	+	+	1															

Table 5

Comparison of *Otenidio moluscae-Seslerietum uliginosae* from Poland and
Seslerietum uliginosae from Czechoslovakia

Locality	P o l a n d		Czechoslovakia	
Number of records	20	3	15	3
Average number of species in one record	36,5		22	29
	a	b	c	d

Ch. *Otenidio moluscae-Seslerietum uliginosae*:

<i>Sesleria uliginosa</i>	V ²⁻⁴	4375	3 ³⁻⁵	V ²⁻⁵	3883	2 ²⁻³
<i>Carex hostiana</i>	V ¹⁻²	482	2 ¹⁻²	II ¹⁻³	369	.
<i>Polygala amarella</i>	IV ¹⁻²	541	1 ⁺	II ¹⁻¹	36	2 ⁺
<i>Otenidium molluscum</i> d	IV ¹⁻³	1351	2 ¹⁻¹	.	.	.

Ch. *Caricion davallianae* :

<i>Campylium stellatum</i> d	V ¹⁻¹	182	2 ¹⁻²	I ¹	33	.
<i>Carex davalliana</i>	V ¹⁻³	2500	1 ⁺	I ¹⁻²	151	1 ⁺
<i>Carex flava</i>	III ¹⁻²	365	1 ⁺	II ¹⁻¹	36	3 ⁺
<i>Orchis latifolia</i>	IV ¹⁻¹	31	.	I ⁺	1	.
<i>Parnassia palustris</i>	V ¹⁻²	454	2 ¹⁻¹	.	.	2 ¹⁻¹
<i>Epipactis palustris</i>	V ¹⁻²	254	1 ⁺	.	.	.
<i>Eriophorum latifolium</i>	V ¹⁻²	578	.	.	.	.
<i>Valeriana simplicifolia</i>	I ¹	50	.	.	.	.

Ch. *Scheuchzerio - Caricetea fuscae* :

<i>Carex panicea</i>	V ¹⁻²	1315	3 ⁺	IV ¹⁻³	1550	1 ⁺
<i>Carex fusca</i>	V ¹⁻¹	303	.	II ¹	133	.
<i>Valeriana dioica</i>	III ¹⁻²	463	1 ⁺	.	.	1 ⁺
<i>Drepanocladus revolvens</i> d	V ¹⁻⁴	1552	.	.	.	.
<i>Camptothecium nitens</i> d	III ¹⁻¹	54	.	.	.	.
<i>Pedicularis palustris</i>	I ⁺	1	.	.	.	.

Ch. *Molinietalia* / ^{XX}*Calthion* ^{XX}*Molinion* / :

<i>Cirsium rivulare</i>	V ¹⁻²	876	2 ⁺	IV ¹⁻¹	137	.
^{XX} <i>Succisa pratensis</i>	IV ¹⁻²	217	3 ¹⁻¹	IV ¹⁻²	221	2 ⁺
^{XX} <i>Molinia coerules</i>	III ¹⁻¹	79	2 ⁺	II ¹⁻²	117	3 ³⁻⁴
<i>Sanguisorba officinalis</i>	I ¹⁻¹	67	3 ¹⁻¹	IV ¹⁻³	637	2 ⁺
<i>Galium boreale</i>	I ¹⁻²	151	3 ¹⁻²	II ¹⁻¹	135	.
<i>Salix rosmarinifolia</i>	II ¹⁻¹	101	1 ¹	I ⁺	1	.
<i>Lychnis flos-cuculi</i>	II ¹⁻¹	52	.	II ¹⁻¹	36	.
<i>Schoenus ferrugineus</i>	I ²	175	.	I ³	250	3 ¹⁻²
<i>Filipendula ulmaria</i>	I ¹	42	.	III ¹⁻²	302	.
<i>Deschampsia caespitosa</i>	II ¹⁻¹	28	1 ⁺	.	.	2 ⁺
<i>Selinum carvifolia</i>	I ¹	33	.	II ⁺	3	.
<i>Equisetum palustre</i>	V ¹⁻³	988	1 ⁺	.	.	.
^{XX} <i>Serratula tinctoria</i>	I ¹⁻¹	50	3 ¹	.	.	.
<i>Galium uliginosum</i>	IV ¹⁻¹	228	.	.	.	.
^X <i>Caltha palustris</i>	III ¹⁻¹	128	.	.	.	.
^X <i>Crepis paludosa</i>	II ¹⁻¹	101	.	.	.	.
<i>Juncus articulatus</i>	II ⁺	4	.	.	.	.
<i>Cirsium canum</i>	.	.	2 ¹⁻¹	IV ¹⁻²	253	3 ⁺
<i>Trollius europaeus</i>	.	.	.	II ¹⁻²	351	.

Ch. *Molinio - Arrhenatheretea* :

<i>Ranunculus acer</i>	V ¹⁻²	565	3 ¹⁻²	V ¹⁻²	436	1 ⁺
<i>Prunella vulgaris</i>	IV ¹⁻¹	277	3 ¹⁻²	I ¹⁻¹	35	1 ¹
<i>Briza media</i>	III ¹⁻¹	55	3 ¹⁻¹	V ¹⁻²	387	2 ⁺
<i>Lotus corniculatus</i>	II ¹⁻¹	53	1 ⁺	III ¹⁻²	251	.
<i>Trifolium pratense</i>	II ¹⁻¹	52	2 ⁺	I ⁺	2	.
<i>Centaurea jacea</i>	IV ¹⁻¹	216	3 ¹⁻²	.	.	3 ¹
<i>Plantago lanceolata</i>	III ¹⁻¹	55	3 ⁺	.	.	.
<i>Leontodon hispidus</i>	II ¹⁻¹	28	2 ⁺	.	.	.
<i>Achillea millefolium</i>	II ¹⁻¹	27	2 ⁺	.	.	.
<i>Vicia cracca</i>	II ¹⁻¹	52	2 ⁺	.	.	.
<i>Anthoxanthum odoratum</i>	.	.	.	V ¹⁻²	257	.
<i>Festuca rubra</i>	.	.	.	IV ¹⁻²	286	.
<i>Alectorolophus minor</i>	.	.	.	II ¹	167	1 ⁺
<i>Luzula multiflora</i>	.	.	.	II ⁺	3	.

Other :

<i>Potentilla erecta</i>	V ¹⁻³	1339	3 ¹⁻²	II ¹⁻²	301	3 ²
<i>Calliergon cuspidatum</i> d	V ¹⁻⁴	4988	2 ⁺	I ²⁻⁵	700	.
<i>Linum catharticum</i>	III ¹⁻¹	103	2 ⁺	II ¹⁻²	250	2 ¹⁻¹
<i>Carex glauca</i>	III ¹⁻²	601	.	IV ¹⁻²	435	1 ⁺
<i>Phragmites communis</i>	III ¹⁻²	278	.	II ¹⁻¹	134	1 ⁺
<i>Fissidens adiantoides</i> d	V ¹⁻²	466	.	I ¹	33	.
<i>Galium verum</i>	III ¹⁻²	203	3 ⁺	.	.	3 ¹⁻²
<i>Mentha arvensis</i>	III ¹⁻¹	54	.	.	.	2 ⁺
<i>Thuidium philibertii</i> d	III ¹⁻²	141	2 ¹⁻¹	.	.	.
<i>Tetragonolobus siliquosus</i>	III ¹⁻²	214	.	.	.	2 ¹⁻¹
<i>Gymnadenia conopsea</i>	.	.	.	II ¹⁻¹	36	.
<i>Ranunculus auricomus</i>	.	.	.	IV ¹⁻¹	105	.
<i>Phyteuma orbiculare</i>	.	.	.	.	.	2 ⁺

a/ 20 records Głazek - 1983

b/ 3 records Medwecka - Kornaś - 1959

c/ 15 records Klika - 1943

d/ 3 records Zlatník - 1928

(presence of the slightly halophyte species as *Tetragonolobus siliquosus* in the records and *Trifolium fragiferum* outside them indicates that), c) slightly dried at sites where the water table is lower because of meliorations and comparing to the others poorer in character species.

Analogous community has been described in Czechoslovakia (Zlatník 1928, Klika 1943, 1946, 1955). Klika (1943) classified it as an association, with *Sesleria uliginosa* as a character species. It is not a good diagnostic species as in the centre of its occurrence it enters xerothermic sods (Zlatník 1928), while in Poland it is a species which distinguish community with *Sesleria varia* and *Scorzonera purpurea* (Kozłowska 1928) named later *Seslerio-Scorzoneretum purpureae* (Medwecka-Kornaś 1959).

The author has listed three other character species in aim to better determine the association, that is *Carex hostiana*, *Polygala amarella* and *Ctenidium molluscum*. All of them, as well as *Sesleria uliginosa* well distinguish community among the other eutrophic sod fens of the *Caricion davallianae* alliance. They are (except *Ctenidium molluscum*) character species in the supra-regional sense (Table 4) and they seem to attain there the optimum of their development.

When phytosociological tables from Poland and Czechoslovakia are compared (Zlatník 1928, Klika 1943, Medwecka-Kornaś 1959, Głazek, in press) distinct similarities in the floristic composition and occupied habitat can be seen. The slight differences are probably caused by a varied soil moisture of the habitat. The records in Czechoslovakia have been done in the dryer areas, that is why floristic composition are poor in respect of the character species *Caricion davallinae* alliance, *Scheuchzerio-Caricetea fuscae* class and *Molinietalia* order (Table 5).

According to Zlatník (1928) wet meadows with *Sesleria uliginosa* which occur in different areas have got similar floristic composition and are not diversified in respect of their geography — what has been proved when the communities from Czechoslovakia and Poland have been compared.

Phytocoenoses of eutrophic fens of *Ctenidio molluscae-Seslerietum uliginosae* from an interesting element in the vegetation of Poland in aspect of the research and didactics. Unfortunately, meliorations ploughing, additional sowing of grasses and leguminous plants have damaged and disturbed communities in the large area. Thus, the best patches should be protected as unchangeable areas. They should obtain the same status as Pawłowski (1950), Denisiuk (1965), Medwecka-Kornaś (1971), Piotrowska (1974) and others have proposed for the wet meadows.

In Poland *Ctenidio molluscae-Seslerietum uliginosae* has its specific ecology and species composition which differentiate it from other Polish

associations of the *Caricion davallinae* alliance. Occurrence in the phytosociological records from Czechoslovakia and Poland of such important from the community species as *Sesleria uliginosa*, *Carex hostiana*, *Polygala amarella* indicates its supra-regional character.

The lack of phytosociological records from the north of Europe (Sweden and USSR — Latvia, Estonia and Belorussia) makes impossible the analysis of its geographical variability within its range of occurrence.

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Ctenidio molluscae-Seslerietum uliginosae Klika 1943 em. Głazek 1983 —
nowy zespół roślinny w Polsce

Streszczenie

W pracy przedstawiono stosunki ekologiczno-fitosocjologiczne nowo wyróżnionego dla Polski zespołu *Ctenidio molluscae-Seslerietum uliginosae* występującego na terenie województwa kieleckiego w obrębie mezoregionów: Góry Świętokrzyskie, Pogórze Szydłowskie i Dolina Nidy. Fitocenozy tego typu wykształcają się w dolinach rzek i cieków, ale tylko tych odcinków, które rozcinają wzgórza wapienne i gipsowe, a poza tym w zagłębieniach terenu, między pasemkami wzniesień zbudowanych z wapieni i gipsów. Są to siedliska wilgotne, na których powstały gleby organiczno-mineralne, należące do gleb torfowych, torfowisk niskich i gleb torfiasto-murszowych oglejonych (ryc. 1), i zasobne w składniki mineralne (tab. 1, 2). Stosunki florystyczne zbiorowiska przedstawia 20 zdjęć fitosocjologicznych tabeli 3. Z analizy zebranego materiału wynika, że mamy tu do czynienia z jednostką dobrze ustabilizowaną pod względem florystycznym i ekologicznym. Za gatunki charakterystyczne dla zespołu *Ctenidio molluscae-Seslerietum uliginosae* (w znaczeniu ponadregionalnym) uznano: *Sesleria uliginosa*, *Carex hostiana*, *Polygala amarella* i *Ctenidium molluscum*. Struktura fitosocjologiczna zbiorowiska określa w sposób jednoznaczny jego miejsce w systemie zbiorowisk torfowisk niskich ze związku *Caricion davallianae* (tab. 4).