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**Floristic diversity of chosen grass communities
in the Nadwieprzański Landscape Park**

Różnorodność florystyczna wybranych zbiorowisk trawiastych
w Nadwieprzańskim Parku Krajobrazowym

Summary. The studies were carried out in 2005 on the meadows of the Nadwieprzański Landscape Park. Their aim was to recognize the flora and establish some grass communities in the middle course of the Wieprz river. Grass communities of the investigated area belong to *Molinio-Arrhenatheretea* and *Phragmitetea* class and show medium and high floristic differentiation. In the studied associations, a total number of 127 plant species, belonging to 36 botanical families were recorded. Due to the diversity of plant associations and abundance of species, the Wieprz valley meadows are very attractive as regards the landscape and, thus may be inviting for tourists and people sensitive to the beauty of nature.

Key words: floristic diversity, communities of valley meadows, Nadwieprzański Landscape Park

INTRODUCTION

Although river valleys were the objects of the anthropogenic habitat transformation for many years, they are characterized by great nature values. Specific site conditions of these areas, especially connected with differentiated soil moisture, favour the occurrence of diverse communities. The oldest and most frequently applied measure for floristic diversity is the number of species. Taking into account a number of vascular plant species, Kostuch [1995] assigns grass communities into three groups: 1) communities of low floristic diversity – up to 20 species in the relevé, 2) medium diversity – 20–40 species, 3) communities of high diversity – over 40 species in the releve. The riverside meadows and pastures show particularly high habitat diversity and richness of flora that determines the landscape attractiveness of this region [Mosek 1995].

The aim of these studies was to recognize the flora and specify floristic diversity of some grass communities in the Nadwieprzański Landscape Park.

MATERIAL AND METHODS

The researches were carried out on the meadows of the Nadwieprzański Landscape Park, in the middle course of the Wieprz river, between Łęczna and Ciechanki Krzesimowskie (Lublin region). Analyzing the structure of the Nadwieprzański Landscape Park, it was noted that meadows and pastures constitute 25.8% of this area.

The studies performed in spring and summer 2005 comprised 44 phytosociological surveys. They were taken on the meadows at the right side of the Wieprz river according to Braun-Blanquet method. The survey area ranged from 10 up to 150 m². The following parameters were assessed: phytosociological variability, floristic richness and diversity on the basis of the species number (total = cumulative species richness of all the surveys for a plant community). Besides, at the same areas, the sward was sampled to determine the floristic composition of the swards by a botanical-weight method. Nomenclature of plant communities was accepted after Matuszkiewicz [2001]. The constancy levels after the 5-degree scale were established for the communities distinguished in at least 10 surveys. In the other communities, there were defined the ranges of quantity levels. Identification of a life form was made according to Raunkiaer, after Rutkowski [1998].

RESULTS AND DISCUSSION

Diverse belts of the meadow vegetation situated square with the river-bed are the separate plots owned by different holders. The grass associations occurring in the investigated section of the Wieprz valley show the varied management intensity, which plays a decisive role determining the floristic diversity of meadows and pastures [Kostuch 1995]. It is frequently observed that the adjacent plots demonstrate an absolutely different plant structure as well as a different colour of sprouts and inflorescences. There were established 127 plant species, mainly hemicryptophytes (Fig. 1) that belong to 36 botanical families. The most abundant appeared to be species from *Poaceae* family (Fig. 2).

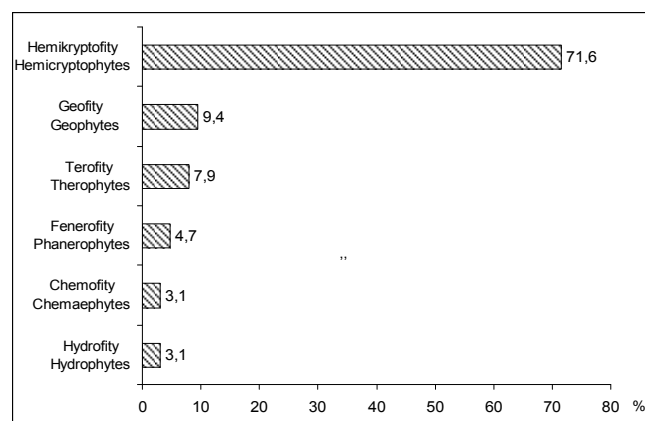


Fig. 1. Share of living forms according to Raunkiaer in the studied grass communities of the Nadwieprzański Landscape Park

Rys. 1. Udział form życiowych wg Raunkiaera w wybranych zbiorowiskach Nadwieprzańskiego Parku Krajobrazowego

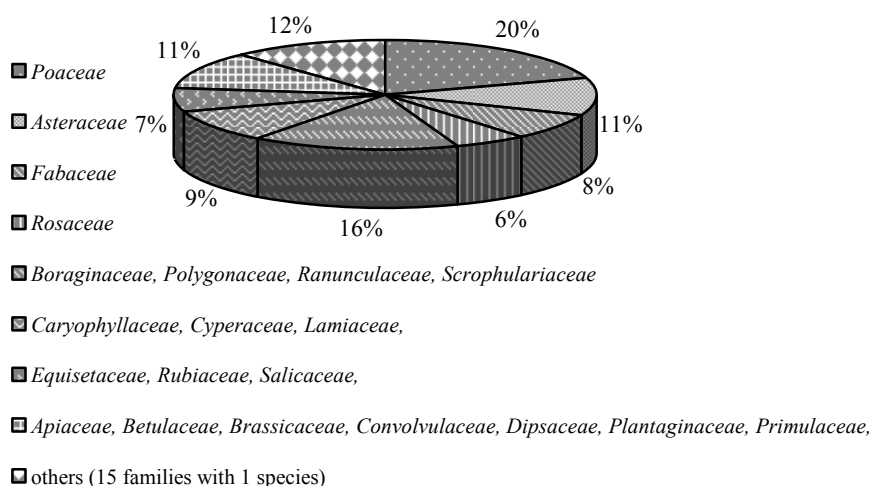


Fig. 2. Botanical families in the studied grass communities of the Nadwieprzański Landscape Park
Rys. 2. Rodziny botaniczne w wybranych zbiorowiskach Nadwieprzańskiego Parku Krajobrazowego

Floristic diversity of the studied grass associations is reported in both, parallel and perpendicular location to the river-bed. The sites slightly elevated and at the valley borders are dominated by the sward from *Molinio-Arrhenatheretea* class, within which the distinguished associations belonged to the following orders: *Arrhenatheretalia elatoris*, *Molinietalia*. The most abundant association is *Arrhenatheretum elatoris*, with a high share of the natural vegetation, in that mainly grasses, legumes as well as herbs and weeds (Tab. 1).

The grasslands on which *Alopecuretum pratensis* and *Poa pratensis-Festuca rubra* occurred were characterized with a great amount of valuable species of grasses that decide about their feed usability. The floristic composition of the examined association includes a number of legumes and herbal plants, about 60%. According to Trzaskoś [1996], floristic differentiation of herb meadows improves the view values of an open landscape, constituting the “multi-colour oases traversed by rivers”. At the green background of plant vegetation there persists an incessant rotation of colours related with the developmental and flowering stages of the species composing the sward. During the vegetative period a constant sequence of colours and their shades is observed, from white and yellow in spring, pink, red and brown in summer to white again in late summer and autumn beginning. Maintenance of high floristic differentiation (70–80 species) of plant associations in the Wieprz river valley requires not too intensive utilization.

In the investigated part of the Wieprz river valley the zone formation is observed which developed due to a long-lasting impact of the river outflows in spring. Similar observations Wylupek [2002] refer to the Por river valley. Close to the river-bed and valley lowering, there appear canopies of the communities from *Phragmitetea* class (Tab. 2).

Table 1. Flora characteristics of some communities from *Molinio-Arrhenatheretea* class
 Tabela 1. Charakterystyka flory wybranych zbiorowisk z klasy *Molinio-Arrhenatheretea*

Specification Wyszczególnienie	<i>Arrhenatheretalia</i>		<i>Molinietalia</i>
	◆ <i>Arrhenatheretum elatioris</i>	● <i>Poa pratensis-Festuca rubra</i> community – zbiorowisko	■ <i>Alopecuretum pratensis</i>
Number of surveys Liczba zdjęć	11	10	10
Species number ranges in survey Wahania liczby gatunków w zdjęciu	18–42	20–40	6–37
Number of species Liczba gatunków	80	70	67
Botanical composition of communities – Skład botaniczny zbiorowisk			
Grasses Trawy	26	27	27
Legumes Motylkowate	9	7	8
Herbs & weeds Zioła i chwasty	60	56	58
Sedges & horsetails Turzycowate i skrzypowate	5	7	8
Characteristic species for the associations – Gatunki charakterystyczne dla zespołów			
◆ <i>Arrhenatherum elatius</i>	V ^{+ -3}	II ⁺	I ¹
● <i>Festuca rubra</i>	V ^{+ -2}	V ^{+ -2}	III ^{+ -2}
● <i>Poa pratensis</i>	V ^{+ -2}	IV ^{+ -3}	V ^{+ -4}
■● <i>Alopecurus pratensis</i>	V ^{+ -2}	V ^{+ -3}	V ^{1 -5}
◆ <i>Geranium pratense</i>	V ^{+ -4}	V ^{+ -2}	IV ^{+ -1}
■ <i>Glechoma hederacea</i>	V ^{+ -1}	IV ^{+ -1}	V ^{+ -1}
● <i>Holcus lanatus</i>	III ^{+ -2}	V ^{+ -3}	IV ^{+ -3}
■ <i>Symphytum officinale</i>	-	II ⁺	III ⁺
■ <i>Ranunculus auricomus</i>	I ⁺	I ¹	I ⁺
■ <i>Poa palustris</i>	I ⁺	-	I ⁺
Number of characteristic species – Liczba gatunków charakterystycznych			
<i>Arrhenatheretalia</i>	8	8	
<i>Molinietalia</i>			3
<i>Molinio-Arrhenatheretea</i>	15	15	15
Number of companion species Liczba gatunków towarzyszących	48	36	39

+ - 2 – quantitative range – zakres ilościowości

I–V – constancy – stałość

The presence of *Phalaridetum arundinaceae* and *Glicerietum maximae* was recorded most frequently, while *Caricetum elatae* rarely. The mentioned above communities are also composed of a high number of species from *Molinio-Arrhenatheretea* class. Owing to the excessive drainage and deterioration of a soil structure, in a meadow bog sward the species typical of varying moisture are recorded, i.e. *Holcus lanatus*, *Deschamsia caspitosa*, *Alopecurus pratensis* from *Phragmitetea* class. Some evident changes are noted in the meadow sward of *Phalaridetum association*, where beside the typical phytocenoses, there are reported numerous phytocenoses with a high share of *Alopecurus pratensis*, that was also confirmed by Kryszak *et al.* [2005].

Table 2. Flora characteristics of some associations from *Phragmitetea* class
Tabela 2. Charakterystyka flory wybranych zbiorowisk z klasy *Phragmitetea*

Specification Wyszczególnienie	<i>Magnocaricion</i>		<i>Phragmition</i>
	◆ <i>Phalaridetum arundinaceae</i>	● <i>Caricetum elatae</i>	■ <i>Glicerietum maximae</i>
Number of surveys Liczba zdjęć	5	1	7
Wahania liczby gatunków w zdjęciu Species number ranges in survey	13–35	24	7–32
Number of species Liczba gatunków	63	24	54
Botanical composition of communities – Skład botaniczny zbiorowisk			
Grasses Trawy	29	25	28
Legumes Motylkowate	10	4	8
Herbs & weeds Zioła i chwasty	56	63	59
Turzycowate i sitowate Sedges & horsetails	6	8	6
Characteristic species for the associations (quantitative range) Gatunki charakterystyczne dla zespołów (zakres ilościowości)			
◆ <i>Phalaris arundinacea</i>	2–5	1	+ - 2
● <i>Carex elata</i>	1–3	3	+ - 1
■ <i>Glyceria maxima</i>	-	-	3–4
Number of characteristic species Liczba gatunków charakterystycznych			
<i>Magnocaricion</i>	12	12	2
<i>Phragmition</i>			1
<i>Phragmitetea, Phragmitetalia</i>	1		1
Number of companion species Liczba gatunków towarzyszących	48	10	47

Glycerietum maximae community occupies quite a big meadow area of the examined region. It develops wide or narrow belts at the banks of meanders and the over-flow arm of the Wieprz in the area lowering as well as in the drainage ditches not conserved properly. Regarding to the floristic value, the described community is reported to be species-poor and its appearance dominated by *Glyceria maxima*.

CONCLUSIONS

1. Grass associations of the investigated area of the Nadwieprzański Landscape Park belong to *Molinio-Arrhenatheretea* and *Phragmitetea* class and show medium and high floristic differentiation.

2. In the studied associations, total number of 127 plant species were recorded that belonged to 36 botanical families. There were distinguished 7 life forms according to Raunkiaer, with hemicryptophytes as predominant.

3. Species richness in the grass associations in the Nadwieprzański Landscape Park causes the occurrence of sequence of colours over the vegetative period when the species bloom successively along with plant development. That yields delightful esthetic sensations and emphasizes the importance of grassland in a landscape. Due to diversity of associations and richness of species, the Wieprz valley meadows are very attractive as regards the landscape and, thus may be inviting for tourists and people sensitive to the beauty of nature.

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Streszczenie. Badania przeprowadzono na łąkach Nadwieprzańskiego Parku Krajobrazowego. Celem badań było rozpoznanie szaty roślinnej i określenie florystycznej różnorodności zbiorowisk trawiastych w środkowej części doliny Wieprza. Zbiorowiska trawiaste badanego obszaru reprezentują klasę *Molinio-Arrhenatheretea* i *Phragmitetea* i wykazują średnie lub duże zróżnicowanie florystyczne. W badanych zespołach stwierdzono występowanie 127 (suma) gatunków, należących do 36 rodzin botanicznych. Różnorodność zbiorowisk oraz bogactwo gatunków sprawiają, że łąki w dolinie Wieprza są bardzo ciekawe krajobrazowo i mogą stanowić atrakcję dla turystów i ludzi wrażliwych na piękno przyrody.

Słowa kluczowe: różnorodność florystyczna, zbiorowiska łąk dolinowych, Nadwieprzański Park Krajobrazowy