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VEGETATION OF THE "UROCZYSKO JARY" NATURE RESERVE NEAR ZŁOTÓW

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ABSTRACT. The paper presents the results of geobotanical research carried out in 2003. 34 types of plant communities were noted. The list of communities consists mainly of the forest ecosystems, rushes, peat bogs, marshes and meadows.

Key words: Uroczysko Jary, nature reserve, geobotany, Wielkopolska region

Introduction

The nature reserve "Uroczysko Jary" was established 23.12.1998, for the preserving the habitats of the rare species, typical for the forests, shrubs and wetland communities, situated in the glacial landscape (Rozporządzenie... 1998). The natural values of the reserve are determined by its complicated topography, formed as an effect of glacial and glacifluvial processes. The object is situated in western part of Krajeńskie Lakeland, being a part of South-Pomeranian Lakeland (**Kondracki** 2000). The terrain belongs to the district Złotów in northern part of the Wielkopolska voivodship. The reserve covers the area of 86.26 ha.

The most important forest habitats of the reserve are acidophilous mixed coniferous--deciduous forest (31.31 ha) and mixed deciduous-coniferous forest (15.68 ha). Smaller areas are covered by coniferous forest (3.05), fertile deciduous forest (2.86), alder-ash forest (1.99), swampy alder forest (1.66) and humid deciduous-coniferous forest (1.43). The forest ecosystems of the reserve cover 53.67 ha, and the forested peat bogs and mires – 5.12 ha. Significant part of the area of the object is covered by lakes – 21.44 ha. The water reservoirs of the reserve consist of the lakes: Górzno Górne, Górzno Dolne, Rezerwat and Zatopione Bagno (Fig. 1). The non-forest ecosystems (6.03 ha) cover the meadows, fallows, non-forested peat bogs, rushes and marshes and the anthropogenic communities (mainly along the roads).

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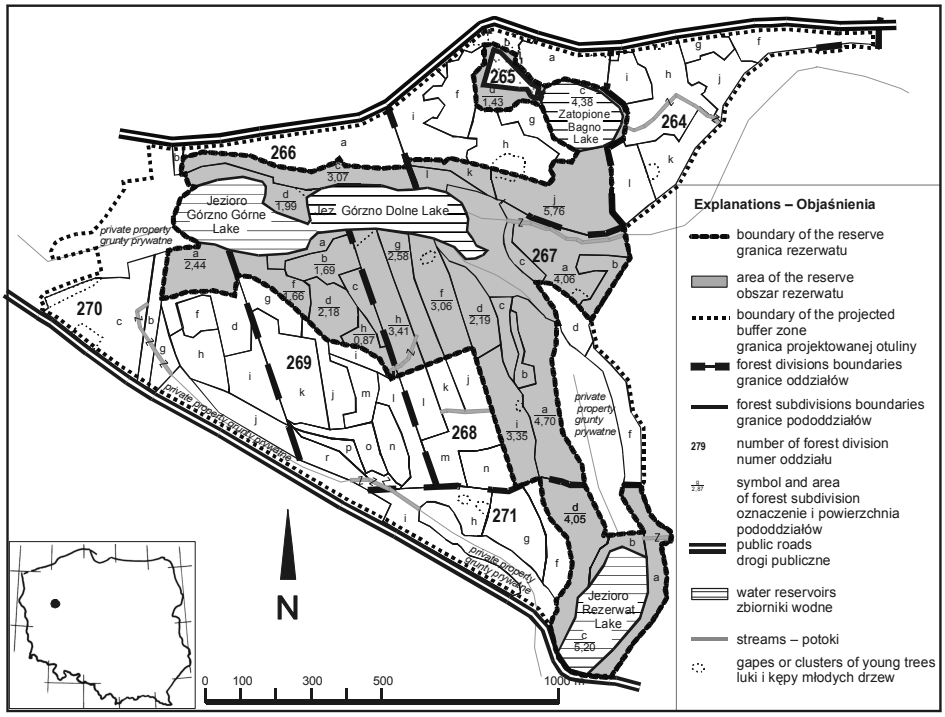

Fig. 1. The map of the nature reserve "Uroczysko Jary" near Złotów
Ryc. 1. Mapa rezerwatu przyrody „Uroczysko Jary" koło Złotowa

The preliminary description of the vegetation of the reserve was prepared by **Jasnowska** and **Jasnowski** (1988). They noted, among others, the occurrence of *Hildenbrandtia rivularis* and *Ophioglossum vulgatum*. These rare species of plants are still present in the described object. In the first half of XX century the object was lustrated by **Koppe** and **Koppe** (1940). The authors published the observations of rare moss species: *Hamatocaulis vernicosus* and *Paludella squarrosa* (**Koppe** and **Koppe** 1940). The presence of these species was not confirmed during the research in 2003 (P. Urbański, unpubl.).

The strong differentiation of the habitats, being an effect of natural conditions and different kinds of anthropopression, caused high biodiversity of the reserve. The plant cover of the area consists of natural communities of the littoral zones of the lakes, peatbogs and mires, forest ecosystems, seminatural meadows and synanthropic communities The presented paper is a documentation of the present plant cover of the reserve.

Material and methods

The list of plant communities consists the syntaxa noted during the research in the vegetational season of the year 2003. The nomenclature of the syntaxa was taken according to **Brzeg** and **Wojterska** (2001). The diagnosis of particular plant communities

is done according to the propositions of **W. Matuszkiewicz** (2001) and **J.M. Matuszkiewicz** (2001). The floristic composition of chosen types of plant communities is presented as a phytosociological relevés, prepared using classical Braun-Blaunquet method (**Braun-Blanquet** 1951, **Pawłowski** 1977, **Dierschke** 1994). As a measure of the abundancy of species, the modified Barkman scale was used (**Barkman** et **al.** 1964).

Results

Index of syntaxa

FOREST AND SHRUB COMMUNITIES

Cl. *Vaccinio-Piceetea* Br.-Bl. 1939
- O. *Cladonio-Vaccinietalia* Kiell.-Lund 1967
  - All. *Dicrano-Pinion* Libb. 1933
    - (1) Ass. ***Querco roboris-Pinetum*** (W. Mat. 1981) J. Mat. 1988

Cl. *Querco-Fagetea* Br.-Bl. et Vlieger 1937
- O. *Fagetalia sylvaticae* Pawł. in Pawł., Sokoł. et Wall. 1928
  - All. *Alnion incanae* Pawł. in Pawł. et al. 1928 (= *Alno-Padion* R. Knapp 1942)
    - (2) Ass. ***Fraxino-Alnetum*** W. Mat. 1952 (= *Circaeo-Alnetum* Oberd. 1953)
    - (3) Ass. ***Querco-Ulmetum minoris*** Issler 1924 (= *Ficario-Ulmetum campestris* Knapp 1942)
  - All. *Fagion sylvaticae* Luquet 1926 em. Lohm. et R. Tx. in R. Tx. 1954
    - (4) Ass. ***Deschampsio flexuosae-Fagetum*** Schröder 1938 (= *Luzulo pilosae--Fagetum* W. Mat. et A. Mat. 1973)
  - All. *Carpinion betuli* Issler 1931 em. Oberd. 1957
    - (5) Ass. ***Galio sylvatici-Carpinetum*** (R. Tx. 1937) Oberd. 1957
    - (6) Community ***Pinus-Quercus-Geranium*** – plantations of Scotch pine on the habitat of the oak-hornbeam forest

Cl. *Alnetea glutinosae* Br.-Bl. et R. Tx. 1943
- O. *Alnetalia glutinosae* R. Tx. 1937
  - All. *Alnion glutinosae* (Malc. 1929) Meijer Drees 1936
    - (7) Ass. ***Carici elongatae-Alnetum*** W. Koch 1926 ex R. Tx. 1931
    - (8) Ass. ***Salicetum cinereae*** Kobendza 1939 typical form
    - (9) Ass. ***Salicetum cinereae*** Kobendza 1939 form with ***Sphagnum*** sp. div.

Cl. *Rhamno-Prunetea* Rivas-Goday et Borja Carbonell 1961 ex R. Tx. 1962
- O. *Prunetalia spinosae* R. Tx. 1952
  - All. *Urtico-Crataegion* Pass. in Pass. et Hofmann 1968 (= *Carpino-Prunion spinosae* (R. Tx. 1952) Weber 1974
    - (10) Ass. ***Euonymo-Prunetum spinosae*** (Hueck 1931) Pass. in Pass. et Hofmann 1968

Others
- (11) ***Picea abies*** **community** (plantations of European spruce)
- (12) ***Pinus sylvestris*** **community** (plantations of Scotch pine)

NON-FOREST COMMUNITIES

Non-forest natural communities

Cl. *Potametea* R. Tx. et Preg 1942 ex Oberd. 1957
O. *Potametalia* W. Koch 1926
All. *Nymphaeion* Oberd. 1957
(13) Ass. ***Nymphaeo albae-Nupharetum luteae*** Nowiński 1928 (= *Nupharo-Nymphaeetum albae* Tomaszewicz 1977)
(14) Ass. ***Potametum natantis*** Soó 1927 ex Podbielkowski et Tomaszewicz 1978

Cl. *Phragmitetea australis* (Klika in Klika et Novák 1941) R. Tx. et Prsg 1942
O. *Phragmitetalia australis* W. Koch 1926
All. *Phragmition communis* W. Koch 1926
(15) Ass. ***Scirpetum lacustris*** (Allorge 1922) Chouard 1924
(16) Ass. ***Typhetum latifoliae*** Soó 1927 ex Lang 1973
(17) Ass. ***Phragmitetum communis*** (W. Koch 1926) Schmale 1939
(18) Ass. ***Acoretum calami*** Eggler 1933 ex Kobendza 1938
(19) Ass. ***Equisetetum fluviatilis*** Steffen 1931
All. *Magnocaricion elatae* W. Koch 1926
(20) Ass. ***Cicuto-Caricetum pseudocyperi*** Boer et Sissingh in Boer 1942
(21) Ass. ***Caricetum acutiformis*** Eggler 1933
(22) Ass. ***Caricetum vesicariae*** Br.-Bl. et Denis 1926
O. *Nasturtio-Glycerietalia* Pignatti 1953
All. *Oenanthion aquaticae* Hejný ex Neuhäusl 1959
(23) Ass. ***Eleocharitetum palustris*** Schennikov 1919 ex Ubrizsy 1948

Cl. *Scheuchzerio-Caricetea fuscae* (Nordhagen 1936) R. Tx. 1937
O. *Scheuchzerietalia palustris* Nordhagen 1936
All. *Rhynchosporion albae* W. Koch 1926
(24) Ass. ***Sphagno apiculati-Caricetum rostratae*** Osvald 1923 em. Steffen 1931

Non-forest, seminatural or synanthropic communities

Cl. *Calluno-Ulicetea* Br.-Bl. et R. Tx. 1943 em. Preising 1949 (= *Nardo-Callunetea* Prsg 1949)
O. *Vaccinio-Genistetalia* Schubert 1960
All. *Pohlio-Callunion* (Shimwell 1973) Brzeg 1982
(25) Ass. ***Sieglingio-Agrostietum capillaris*** Balcerk. et Brzeg 1978

Cl. *Molinio-Arrhenatheretea* R. Tx. 1937 em. 1970
O. *Molinietalia* W. Koch 1926
(26) Fertile herb communities from the order *Molinietalia*
All. *Calthion* R. Tx. 1937
(27) Ass. ***Scirpetum sylvatici*** Ralski 1931
(28) Ass. ***Epilobio-Juncetum effusi*** Oberd. 1957 form with *Populus tremula*
O. *Trifolio repentis-Plantaginetalia majoris* (R. Tx. et Prsg in R. Tx. 1950 em. Siss. 1969) Brzeg 1991 ex Balcerk. et Pawlak 2001

All. *Cynosurion* R. Tx. 1947 em. Brzeg et M. Wojterska 1996 (= *Lolio-Plantaginion maioris* Siss. 1969)
(29) Ass. ***Lolio-Plantaginetum*** Beger 1932 em. Siss. 1969
(30) Ass. ***Prunello vulgaris-Plantaginetum*** Faliński 1961 ex 1963
All. *Agropyro-Rumicion crispi* Nordhagen 1940 em. R. Tx. 1950
(31) Ass. ***Potentilletum anserinae*** Rapaics 1927 em. Pass. 1964

Cl. *Artemisietea vulgaris* Lohmeyer, Preising et R. Tx. in R. Tx. 1950
(32) Complex of the nitrophilous perrenials and shrubs communities from the class *Artemisietea*
O. *Onopordetalia acanthi* Br.-Bl. et R. Tx. 1943 em. R. Tx. 1950
All. *Convolvulo arvensis-Agropyrion repentis* Görs 1966
(33) Ass. ***Convolvulo arvensis-Agropyretum repentis*** Felföldy (1942) 1943
(34) Community with ***Calamagrostis epigejos*** (non *Calamagrostietum epigei* Juraszek 1928)

The description of the plant communities

(1) ***Querco roboris-Pinetum*** – acidophilous pine-oak forest

The acidophilous pine-oak forests cover the biggest part of the forest area in the reserve. The best-formed and preserved patches are present in the forest divisions 269d and h. The tree layer, having usually low density, is formed mainly by *Pinus sylvestris*, with smaller participation of *Quercus petraea* and *Q. robur*. In the shrub layer with high abundancy occur *Sorbus aucuparia*, *Frangula alnus*, *Betula pendula* and the oaks. The herbs are dominated by *Deschampsia flexuosa*, *Oxalis acetosella* with the admixture of *Dryopteris carthusiana*, *Vaccinium myrtillus* and juvenile individuals of trees and shrubs. Especially rich is the moss layer, whose cover reaches 90%. It is formed mainly by acidophilous species: *Pleurozium schreberi*, *Pseudoscleropodium purum*, *Dicranum scoparium* with smaller participation of *Dicranum undulatum* or *Hylocomium splendens*.

The common elements of the most forms of the described forest are *Rubus idaeus*, *R. sprengelii* or *R. plicatus*.

(2) ***Fraxino-Alnetum*** (= *Circaeo-Alnetum*) – fertile alluvial alder-ash forest

The phytocoenoses of the fertile alder-ash forest are located in the lower terraces of the valleys, at the bases of the slopes. The best-preserved patch of this type grows along the eastern bank of the Górzno Dolne Lake. The phytocoenoses are present also along the northern banks of the lakes Górzno Dolne and Górzno Górne.

The tree layer is formed by *Fraxinus excelsior* and *Alnus glutinosa*. The shrub layer, having the density reaching 70% is formed by *Frangula alnus* and the species of trees mentioned above. Especially rich and dense is the herb layer. The species determining the type of ecosystem are *Impatiens noli-tangere*, *Viola riviniana*, *Circaea lutetiana*, *Chrysosplenium alternifolium*, *Stellaria nemorum*, *Fraxinus excelsior* and the moss species *Plagiomnium undulatum*. The small participation in the described type of forest has species typical for the swamp ash forests (*Solanum dulcamara*, *Lysimachia vulgaris*) or marshes (*Phragmites australis*, *Galium palustre*, *Scutellaria galericulata*). In the patches of *Fraxino-Alnetum*, covering the terrain between the lakes Górzno Dolne and Górzno Górne, grows a numerous population of rare species of fern – *Ophioglossum vulgatum*.

(3) ***Querco-Ulmetum minoris*** (= *Ficario-Ulmetum campestris*) – fertile alluvial oak-elm forest

The fertile alluvial oak-elm forest is a rare forest community in the reserve. It covers a small area close to the western bank of the Rezerwat Lake. The tree layer is formed by *Ulmus scabra*, with the small admixture of *Alnus glutinosa*. In the dense herb layer dominate the species of fertile deciduous forests: *Aegopodium podagraria*, *Geum urbanum*, *Paris quadrifolia* or *Galeobdolon luteum*.

(4) ***Deschampsio flexuosae-Fagetum*** (= *Luzulo pilosae-Fagetum*) – acidophilous beech forest

The phytocoenoses of acidophilous beech forest are formed on the slope close to the western bank of the lake Rezerwat Lake. The tree layer is formed by *Fagus sylvatica* and *Pinus sylvestris*, and the shrub layer – mainly the beech shrubs. The herb and moss layers are very poor, formed by *Luzula pilosa* and dispersed patches of acidophilous species of mosses.

(5) ***Galio sylvatici-Carpinetum*** – fertile oak-hornbeam forest

The phytocoenoses of the oak-hornbeam forest cover a small area in the forest division 267a. However, the flora of the patches is very poor. The tree layer is formed by oak, hornbeam and birch. In the herb layer occur only not numerous species of plants typical for fertile forests.

(6) ***Pinus-Quercus-Geranium*** community – the plantations of the Scotch pine on the habitats of the fertile oak-hornbeam forest

The described type of phytocoenose is a degenerational form of the fertile oak--hornbeam forest, formed as an effect of the plantation of Scotch pine. It covers the steep slope, exposed to the south, situated along the northern banks of the lakes Górzno Górne and Dolne (division 266c and 265l). At the bases of the slopes, especially in the western part, grow also dense patches of *Euonymo-Prunetum spinosae*. The tree layer, having a small density, is formed mainly by *Pinus sylvestris* and *Quercus robur*. The herb layer has a high cover and is formed mainly by nitrophilous perennials from the class *Artemisietea*: *Geranium robertianum* and *Galeopsis pubescens*.

Cover of layers (%): trees (a) – 65, shrubs (b) – 20, herbs (c) – 80, mosses (d) – 5; area – 350 m^2; locality: division 266c; date: 09.08.2003.

a ***Pinus sylvestris*** 2b.3, ***Quercus robur*** 3.1, *Quercus petraea* +, *Fagus sylvatica* r, *Picea abies* r

b **ChCl.** *Querco-Fagetea*: *Acer pseudoplatanus* 1.1, *Cerasus avium* +, *Fagus sylvatica* r; **ChCl.** *Rhamno-Prunetea*: *Prunus spinosa* 1.1, *Rhamnus catharticus* r, *Crataegus monogyna* r; Others: *Sambucus nigra* +, *Rubus idaeus* r

ChCl. *Artemisietea*: ***Geranium robertianum*** 4.5, *Galeopsis pubescens* 2b.3, *Geum urbanum* 1.1, *Lapsana communis* +, *Cirsium vulgare* r, *Urtica dioica* r, *Carduus crispus* r, *Carex hirta* r
ChCl. *Querco-Fagetea*: *Poa nemoralis* 1.2, *Atrichum undulatum* 1.2
Others: *Mycelis muralis* 1.1, *Moehringia trinervia* r, *Galeopsis tetrahit* et *bifida* +, *Prunus spinosa* +, *Euonymus europaea* +, *Sambucus nigra* +, *Knautia arvensis* r, *Dactylis glomerata* r, *Taraxacum officinale* r, *Eupatorium cannabinum* r, *Fragaria vesca* r, *Verbascum lychnitis* r, *Dicranella heteromalla* r, *Brachythecium* sp. 1.2

(7) ***Carici elongatae-Alnetum*** – the swamp alder forest

The patches of the swamp alder forests are formed as a narrow stripe along the southern bank of the lakes Górzno Górne and Górzno Dolne (with the best formed fragments in the division 269a), northwestern part of the Lake Rezerwat basin and the

small area on the western bank of the Zatopione Bagno Lake (division 265d). The tree layer is formed by *Alnus glutinosa*, in the lower layers with large admixture of *Frangula alnus*. The herb layer is usually dense, formed by the species of marshes, especially: *Carex elata*, *C. acutiformis*, *C. vesicaria* and also *Solanum dulcamara*, *Comarum palustre*, *Equisetum fluviatile*, *Galium palustre*.

(8 and 9) ***Salicetum cinereae*** typical form and form with *Sphagnum* sp. div.

The willow shrubs grow along the banks of the lakes, usually between the swamp alder forests and the marshes. They are relatively common in the reserve. The main species of these systems is *Salix cinerea*, with the smaller admixture of *S. pentandra*. The herb layer is formed by hygrophilous species typical for the marshes. The typical forms of this community, with a small abundance of mosses, are located along the banks of the lakes Górzno Górne and Górzno Dolne. The patches are formed mainly by willow. The form with *Sphagnum* sp. div., situated around the banks of the Zatopione Bagno Lake and in the eastern part of the division 265c, is distinguished by the high abundancy of different species of the genus *Sphagnum* and smaller density of the shrub layer. A relatively high abundance have in these patches such species as: *Frangula alnus*, *Betula pendula* and *B. pubescens.* The phytocoenoses of *Salicetum cinereae* form with *Sphagnum* are one of the most valuable ecosystems of the reserve. They are the only habitat of rare species of plants, e.g. *Drosera rotundifolia*, and numerous of mosses and liverworts. Numerous, decaying tree logs are the microbiotope for the rich epixylic flora.

(10) ***Euonymo-Prunetum spinosae***

Dense, termophilous hedges with *Prunus spinosa* cover the slopes exposed to the south, in the vicinity of the lakes Górzno Górne and Górzno Dolne. Except the blackthorn, the abundant components of these hedges are *Rosa canina*, and in the herb layer – termophilous species, like *Agrimonia eupatoria*, *Galium mollugo* and others.

(11, 12) Monocultures of ***Picea abies***

The spruce monocultures are planted in the habitats of acidophilous mixed forest in the divisions (divisions 268b, 267b) and fertile deciduous forest (div. 271a). Because of a very dense tree layer, what causes lack of light in the lower part of the phytocoenoses, the herb layer is very poorly formed.

(12) Monocultures of ***Pinus sylvestris***

The dense plantations of Scotch pine grow in division 267c, in the habitat of the acidophilous mixed forest. In the herb layer, having very small density, occur the species typical for the fertile, deciduous forests.

(13) ***Nymphaeo albae-Nupharetum luteae*** (= *Nupharo-Nymphaeetum albae*)

Nymphaeo-Nupharetum is the most widespread community of the nymphaeids in the reserve. The phytocoenoses are covering littoral zones of the lakes Górzno Górne, Górzno Dolne and Rezerwat.

(14) ***Potametum natantis***

Patches of *Potametum natantis* occur mainly in the littoral zone of the Zatopione Bagno Lake, and sporadically – in the Górzno Górne Lake.

(15) ***Scirpetum lacustris***

The rush community with *Schoenoplectus lacustris* occurs in the south-eastern part of the Górzno Górne Lake, as a complex with two next types of plant communities.

(16) ***Typhetum latifoliae***

The rushes of *Typha latifolia* occur along the banks of the lakes Górzno Górne, Górzno Dolne, and Rezerwat. In division 265c, enclosing the Zatopione Bagno Lake, *Typhetum latifoliae* grows out of the water basin, in wet swamp situated on the western side of the lake.

(17) ***Phragmitetum communis***

The community of common reed is the most widespread of the rush communities in the reserve. They grow along the banks of all the water reservoirs of this area (except the Zatopione Bagno Lake). In the lakes Górzno Górne and Górzno Dolne, they are a dominating type of vegetation, covering totally the shallow part of littoral zone. In the Rezerwat Lake they are concentrated in the northern part of the basin. Additionally, the phytocoenoses with the domination of *Phragmites communis* are covering abandoned meadows on the eastern bank of the Górzno Dolne Lake.

(18) ***Acoretum calami***

The rushes with *Acorus calamus* grow as small patches along the southern banks of the lakes Górzno Górne and Górzno Dolne. The typical patches are built almost only by *Acorus calamus*, but the patches in shallow places have admixture of other hydrophytes, as *Mentha aquatica*, *Glyceria fluitans* and others.

(19) ***Equisetetum fluviatilis***

The horsetail rush is relatively rare component of the plant cover of the studied area. The best-formed patches can be observed in the north-eastern part of the Rezerwat Lake, where it occurs as a complex with the large area of reed rushes. The diagnostic species of the described association is *Equisetum fluviatile*. As an admixture there occur also the species of hydrophytes, species typical for the meadows or for different types of rushes.

(20) ***Cicuto-Caricetum pseudocyperi***

Paths of this association are dispersed in the territory of the studied object, growing on the banks of almost all water reservoirs of the area. The patches situated in the vicinity of the Rezerwat Lake have a significant admixture of the *Sphagnum* and *Calla palustris*.

(21) ***Caricetum acutiformis***

The patches of *Caricetum acutiformis* cover abandoned meadow, adjacent to the alder-ash forest on the eastern bank of the Górzno Dolne Lake. They are very poor floristically, dominated by *Carex acutiformis*, with a small admixture of the species typical for wet meadows and rushes.

(22) ***Caricetum vesicariae***

The small patches of *Caricetum vesicariae* can be observed sporadically along the southern bank of the Górzno Górne Lake.

(23) ***Eleocharitetum palustris***

The association of Common Spike-rush is an important component of the vegetational landscape of the Zatopione Bagno Lake. The patches growing in this area are dominated by *Eleocharis palustris* with the very small admixture of other species. The dispersed phytocoenoses observed along the southern banks of the Górzno Górne Lake are most fertile and consists of significantly more admixtured species.

(24) ***Sphagno apiculati-Caricetum rostratae***

The phytocoenoses of *Sphagno-Caricetum rostratae* are one of the most valuable of plant associations of the reserve. They are forming the biggest part of the peat bog,

covering the area around the basin of the Zatopione Bagno Lake, being the most important component of the local phytocomplex. The herb layer of the described community is formed by *Carex rostrata*, accompanied by *Calla palustris* or *Comarum palustre*. The moss cover is dominated by *Sphagnum*.

(25) ***Sieglingio-Agrostietum capillaris***

Sieglingio-Agrostietum capillaris is a type of phytocoenose connected to the dry habitats on the edges and along the roads in the complex of the pine-oak forest *Querco roboris-Pinetum*. The dominant species are *Sieglingia decumbens*, *Agrostis capillaris* and *Festuca ovina*. Important components of the patches are mosses, usually: *Pleurozium schreberi* and *Dicranum scoparium*. The floristic composition of the chosen patch of the *Sieglingio-Agrostietum* is illustrated below.

Cover of layers (%): herbs (c) – 30, mosses (d) – 98; area – 7 m^2; locality: div. 268h; number of relevé 3, date: 08.08.2003.

Ch. et D*. Ass. *Sieglingia decumbens* 2b.1, *Agrostis capillaris* 1.1, *Festuca ovina** 2a.1
ChCl. *Vaccinio-Piceetea*: *Pleurozium schreberi* 5.5, *Dicranum scoparium* r
Others: *Hieracium pilosella* 2a.2, *Knautia arvensis* 1.1, *Equisetum arvense* 1.2, *Armeria elongata* +, *Anthoxanthum odoratum* r, *Quercus robur* c r, *Achillea millefolium* r, *Cladonia rangiferina* +.2

(26) Herb communities from the order ***Molinietalia***

The tall herb communities on the humid habitats are a part of the complex of seminatural communities, which are covering the terrain to the east from the Górzno Dolne Lake. They cover the lowest and most humid part of this area, which was previously cultivated as a meadows.

(27) ***Scirpetum sylvatici***

The community of the Wood Club-rush is a part of the complex of meadows, and rushes, covering the large abandoned meadow on the east bank of Górzno Dolne Lake. The phytocoenoses are dominated by *Scirpus sylvaticus*, but have significant admixture of the meadow species, e.g. *Lathyrus pratensis*, *Holcus lanatus*, *Festuca pratensis*, *Alopecurus pratensis* and others. The effect of abandoning of the cultivation is the appearance of the fallow species, as *Agropyron repens* or nitrophilous perennials, as *Rumex obtusifolius*.

(28) ***Epilobio-Juncetum effusi*** form with ***Populus tremula***

Epilobio-Juncetum effusi with the poplar is a next component of the complex of the meadow vegetation (localized to the east of the Górzno Dolne Lake), which can be considered as an effect of abandoning of the cultivation. The way of succession in this particular site depends probably on the presence of adjacent patches of the secondary growth poplar and birch forest.

Cover of layers (%): shrubs (b) – 5, herbs (c) – 100, mosses (d) – 3; area – 35 m^2; number of relevé 10, date: 11.08.2003.

b *Populus tremula* 1.1
Ch. et D* Ass. *Juncus effusus* 4.2, *Epilobium palustre** +
ChCl. *Molinio-Arrhenatheretea*: *Filipendula ulmaria* 1.1, *Equisetum palustre* 1.1, *Deschampsia caespitosa* 1.1, *Holcus lanatus* 1.1, *Lotus uliginosus* 1.1, *Cardamine pratensis* 1.1, *Cirsium oleraceum* 1.1, *Rumex acetosa* +, *Rumex crispus* +, *Cerastium holosteoides* +, *Phleum pratense* +, *Ranunculus repens* +, *Ranunculus acer* r, *Lysimachia vulgaris* +, *Galium uliginosum* r, *Cirsium palustre* r

Others: *Poa palustris* 1.1, *Mentha arvensis* 1.1, *Stellaria palustris* +, *Urtica dioica* +, *Geum rivale* +, *Viola palustris* +, *Rhytidiadelphus squarrosus* 1.1, *Glyceria fluitans* +, *Equisetum fluviatile* r, *Potentilla erecta* r

(29) ***Lolio-Plantaginetum***

The patches of *Lolio-Plantaginetum* are formed on the compact soil in a place used as a beach in the north-eastern part of the Górzno Dolne Lake. *Lolio-Plantaginetum* creates the complex together with the patches of *Potentilletum anserinae* (see below). Except *Plantago major* and *Lolium perenne*, the phytocoenoses consist many of meadow species. Due to the extensive use of the beach and high humidity of the soil, the plant cover of the described place is dense.

(30) ***Prunello vulgaris-Plantaginetum***

Prunello-Plantaginetum is an association connected to the roads or paths in the forest landscape. It is widespread in the described object, occurring along the roads, as a narrow strip of the vegetation in the central part of the road. The dominant species are *Prunella vulgaris*, *Plantago major* and *Agrostis capillaris*. The floristic composition is additionally built by the species connected to the places exposed to trading: *Trifolium repens*, *Juncus tenuis*, *Veronica serpyllifolia*, *Poa annua*, *Sagina procumbens*, *Gnaphalium uliginosum*. The additional feature is a presence of synanthropic species, "walking" along the roads due to the anthropochory *Capsella bursa-pastoris*, *Galinsoga parviflora* or *Oxalis stricta*. The relevé cited below presents the floristic composition of chosen patch of *Prunello-Plantaginetum*, growing on the road running through the area covered by *Querco roboris-Pinetum* (div. 269d).

Cover of layers (%): herbs (c) – 90, mosses (d) – 2; area – 5 m^2; number of relevé 2, date: 08.08.2003.

Ch. et D*Ass. *Plantago major* 3.4, *Prunella vulgaris** 3.4, *Poa annua* r
ChCl. *Polygono-Poetea*: *Poa annua* (Ch. Ass.) r, *Capsella bursa-pastoris* r, *Sagina procumbens* r
ChCl. *Molinio-Arrhenatheretea*: *Trifolium repens* +, *Deschampsia caespitosa* r, *Veronica serpyllifolia* r, *Juncus tenuis* +, *Cerastium holosteoides* r
Others: *Agrostis capillaris* 2b.1, *Polygonum persicaria* r, *Rumex obtusifolius* r, *Potentilla argentea* r, *Polygonum hydropiper* r, *Gnaphalium uliginosum* r, *Rubus idaeus* c r, *Fragaria vesca* r, *Moehringia trinervia* r, *Betula pubescens* subsp. *pubescens* c r, *Galinsoga parviflora* r, *Oxalis stricta* r, *Rhytidiadelphus squarrosus* +, *Brachythecium* sp. +, *Mnium* sp. r

(31) ***Potentilletum anserinae***

Potentilletum anserinae is the next plant association connected to the treading and compacting of the soil. The phytocoenoses of this association cover the large area of the beach on the north-eastern part of bank of the Górzno Dolne Lake (forming the complex together with Lolio-Plantaginetum). Moreover, the Silverweed community occurs along the bank of the mentioned lake, especially in places often used by anglers. The patches are dominated by *Potentilla anserina*, accompanied by the plants resistant to treading, e.g. *Plantago major*, *Trifolium repens*, *Poa annua* and meadow species, as *Festuca pratensis*, *Taraxacum officinale* or *Phleum pratense*.

(32) The complex of the nitrophilous perennials and shrubs from the class ***Artemisietea***

The small complex of the nitrophilous ruderal vegetation can be observed in the eastern part of the division 271a, in the local hollow, partially filled with rubble. The complex consists of small patches of the *Sambucetum nigrae* Oberd. 1973 and the communities of herbs, esp. *Agropyro-Urticetum dioicae* Hadač 1978 and *Convolvulo-Agropyretum*.

(33) ***Convolvulo arvensis-Agropyretum repentis***

The phytocoenoses of *Convolvulo-Agropyretum* cover the eastern part of the complex of meadows and abandoned fields, situated along the eastern bank of the Górzno Dolne Lake. The phytocoenoses are formed due to the processes of the succession on the abandoned farmlands. Typical form of *Convolvulo-Agropyretum*, covering the eastern part of the described areas, is a type of community on relatively dry habitats. Among the species from the order *Agropyretalia*, in the patches of this form occur the meadow species. The second form of the association – with *Urtica dioica*, covers most humid soils in local *colluvia*.

***Convolvulo-Agropyretum*, typical form:**
Cover of layers (%): herbs (c) – 100, mosses (d) – none; area – 8 m^2; number of relevé 7, date: 11.08.2003; locality: abandoned field to the west from the Górzno Dolne Lake.

Ass. (opt.) *Agropyron repens* 3.4, *Convolvulus arvensis* 1.1
ChCl. *Artemisietea** (incl. *Agropyretalia*): *Carex hirta* 1.1, *Agrostis gigantea* +, *Urtica dioica** r
ChCl. *Molinio-Arrhenatheretea*: *Dactylis glomerata* 2.3, *Arrhenatherum elatius* 1.1, *Holcus lanatus* 1.1, *Phleum pratense* +, *Poa pratensis* +
Others: *Agrostis capillaris* 1.1, *Campanula rotundifolia* r, *Polygonum amphibium* fo. *terrestre* r

Convolvulo-Agropyretum, form with ***Urtica dioica***; cover of layers (%): herbs (c) – 100, mosses (d) – none; area – 10 m^2; number of relevé 8, date: 11.08.2003; locality: abandoned field to the west from the Górzno Dolne Lake

Ass. (opt.) *Agropyron repens* 3.4
ChCl. *Artemisietea*: *Urtica dioica* 5.5, *Galium aparine* 2.1
ChCl. *Molinio-Arrhenatheretea*: *Arrhenatherum elatius* +, *Holcus lanatus* +, *Poa pratensis* +, *Phleum pratense* +, *Deschampsia caespitosa* r, *Stellaria graminea* r

(34) Community with ***Calamagrostis epigejos***

The patches of the community of *Calamagrostis epigejos* are the last part of the group of grassland communities covering the unused, abandoned fields to the east from the Górzno Dolne Lake. They cover the driest habitats of the area, for example the slopes, exposed to the south, lying between the meadows and the road. Except for the domination of *Calamagrostis epigejos*, the described phytocoenoses are determined by the occurrence of the others species which are typical for the abandoned grounds: *Equisetum arvense*, *Cirsium arvense* or *Agropyron repens*. The termophilous characteristic of these communities is shown by the occurrence of *Agrimonia eupatoria*, *Knautia arvensis*, *Pimpinella saxifraga* and *Galium verum*. Except for the described part of the reserve, the phytocoenoses with *Calamagrostis epigejos* occurs accidentally on the habitats of mixed acidophilous forests, belonging to the *Querco-Pinetum* along the forest roads (for example in the division 267i).

Cover of layers (%): herbs (c) – 100, mosses (d) – none; area – 20 m^2; inclination: 3°, exposition – S; number of relevé 6, date: 10.08.2003; locality: abandoned field to the east from the Górzno Dolne Lake.
ChCl. *Artemisietea** (incl. *Agropyretalia*): ***Calamagrostis epigejos* 4.5**, *Equisetum arvense* 2a.1, *Artemisia vulgaris** 1.2, *Convolvulus arvensis* 1.2, *Agropyron repens* 1.2, *Cirsium arvense* +, *Medicago falcata** +.2, *Torilis japonica** r
ChCl. *Molinio-Arrhenatheretea*: *Arrhenatherum elatius* 1.1, *Phleum pratense* +.2, *Poa pratensis* r, *Achillea millefolium* r
Others: *Agrimonia eupatoria* r, *Agrostis capillaris* +, *Knautia arvensis* r, *Pimpinella saxifraga* r, *Galium verum* r

References

Barkman J.J., Doing H., Segal S. (1964): Kritische Bemerkungen und Vorschläge zur quantitativen Vegetationsanalyse. Acta Bot. Neerl. 13: 394-419.

Braun-Blanquet J. (1951): Pflanzensoziologie. Grundzüge der Vegetationskunde. Springer, Wien.

Brzeg A., Wojterska M. (2001): Zespoły roślinne Wielkopolski, ich stan poznania i zagrożenie. In: Szata roślinna Wielkopolski i Pojezierza Południowopomorskiego. Ed. M. Wojterska. Przewodnik sesji terenowych 52. Zjazdu PTB, 24-28 września 2001, Poznań. Bogucki Wyd. Nauk., Poznań: 39-110.

Dierschke H. (1994): Pflanzensoziologie. Grundlagen und Methoden. Ulmer, Stuttgart.

Jasnowska J., Jasnowski M. (1988): Dokumentacja rezerwatu przyrody p.n. „Górzne Jary". Typescript. Wojewódzki Konserwator Przyrody w Pile, Szczecin.

Kondracki J. (2000): Geografia regionalna Polski. Wyd. Naukowe PWN, Warszawa.

Koppe F., Koppe K. (1940): Vierter beitrag zur Moosflora der Grenzmark Posen-Wespreussen. Grenzmärkische Heimatblätter. Veröffentlichungen der Grenzmärkischen Gesellschaft zur Pflege der Heimate. V. Schneidemühl. Naturwissenschaftliches 16, 3: 3-80.

Matuszkiewicz J.M. (2001): Zespoły leśne Polski. Wyd. Naukowe PWN, Warszawa.

Matuszkiewicz W. (2001): Przewodnik do oznaczania zbiorowisk roślinnych Polski. Vademecum Geobotanicum 3. Wyd. Nauk. PWN, Warszawa.

Mirek Z., Piękoś-Mirkowa H., Zając A., Zając M. (2002): Flowering plants and pterydophytes of Poland. A checklist. – Krytyczna lista roślin naczyniowych Polski. W. Szafer Institute of Botany, Polish Academy of Science, Kraków.

Pawłowski B. (1977): Skład i budowa zbiorowisk roślinnych oraz metody ich badania. In: Szata roślinna Polski. I. Eds W. Szafer, K. Zarzycki. PWN, Warszawa: 237-269.

Rozporządzenie Ministra Ochrony Środowiska, Zasobów Naturalnych i Leśnictwa z dnia 23 grudnia 1998 r. w sprawie uznania za rezerwat przyrody. (1998). Dz. U. Nr 166, poz. 1234.

ROŚLINNOŚĆ REZERWATU PRZYRODY „UROCZYSKO JARY" KOŁO ZŁOTOWA

S t r e s z c z e n i e

Rezerwat przyrody „Uroczysko Jary" został utworzony 23 grudnia 1998 roku dla zachowania siedlisk rzadkich roślin leśnych, zaroślowych i torfowiskowych położonych w rynnach polodowcowych i na dnie jarów. O jego walorach przyrodniczych stanowi jednak głównie rzeźba polodowcowa, na którą składają się rynny, jary, poziomy wodonośne, jeziora, cieki i źródła. Powierzchnia rezerwatu wynosi 86,26 ha. Duże zróżnicowanie siedlisk warunkowane zarówno czynnikami naturalnymi, jak i oddziaływaniem człowieka powoduje powstanie bogatego inwentarza flory naczyniowej rezerwatu oraz zbiorowisk roślinnych. Należy tu roślinność naturalna strefy brzegowej jezior wypełniających rynny polodowcowe oraz zbiorowiska torfowiskowe, lasy gospodarcze, półnaturalne ekosystemy łąkowe i układy synantropijne. Na badanym terenie stwierdzono występowanie fitocenoz 34 syntaksonów.

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