

THE VASCULAR PLANTS OF THE 'OLSZAK I, II' ECOLOGICAL LAND IN POZNAŃ

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Abstract. Despite the changes caused by anthropopressure, the 'Olszak I, II' ecological land is one of the sites with high floral values. Its diversified and rich flora consists of 570 vascular plant taxons. The land is one of the last mainstays of rare and endangered plant species. There are 182 species on the Red Lists, 176 are on the list prepared for the city of Poznań. 14 of "the special care species" are legally protected, and 10 belong to the rare and endangered species of the Wielkopolska region. On the examined area, 4 species considered extinct were discovered, and the existence of 10 dying out species was confirmed. The examined land is outstanding for the high percentage of monumental measure trees, as there are over 100 such trees. 76 most valuable nature monuments are legally protected.

Key words: vascular plants, flora, ecological land, Poznań

INTRODUCTION

The 'Olszak I, II' ecological land is situated in the Cybina river valley. It is one of the 22 ecological lands, which constitute almost 16% of the Poznań green areas [Kurek and Szczepanowski 1998]. This land was established in the year 1994, in order to protect the richness of its forest vegetation, mainly the riparian and dry-ground forests, and the waters of the Cybina and Malta rivers. According to the Poznań Urban Green Areas system, the 'Olszak I, II' ecological land, belongs to the east-cybiński (maltański) wedge of greenery [Czarnecki 1933, Karolczak 1994]. According to Jackowiak [1990], those greenery wedges gather plants with regional or even wider importance. The natural values of Cybina river valley are fully appreciated. That is why an idea originated to create a landscape park, which would encompass Malta areas, the vicinity of Swarzędz, as well as Uzarzewo.

"Malta" owns its unusual name to the former owners of this part of Poznań, the knights of St. John's order, who in the year 1530 settled on the Malta island and thus were called the 'Malta Knights Order'. They were invited to Poznań by the Duke of Wielkopolska Mieszko III Stary, where they came in the year 1178. Malta is closely connected

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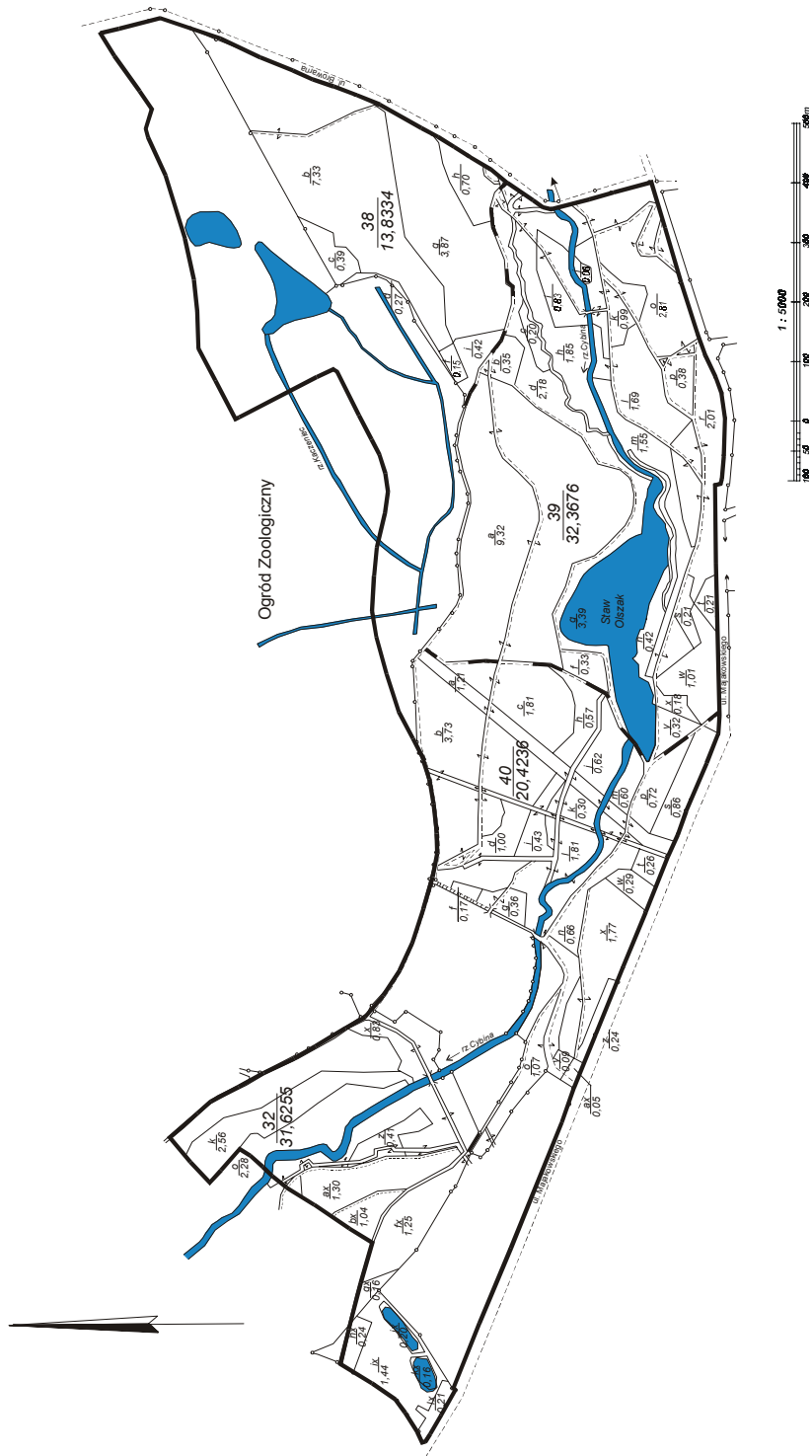


Fig. 1A. The borders and waters of the 'Olszak I' ecological lands
 Rys. 1A. Granice i wody użytku ekologicznego „Olszak I”.

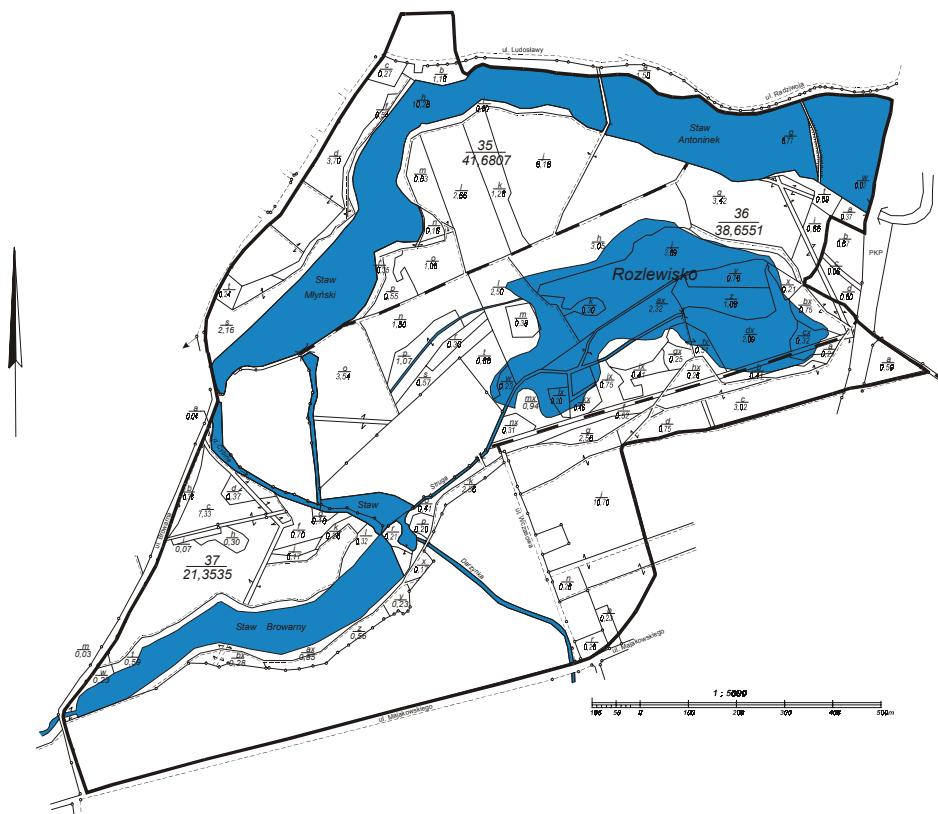


Fig. 1B. The borders and waters of the 'Olszak II' ecological lands
 Rys. 1B. Granice i wody użytku ekologicznego „Olszak II”

with the patriotic tradition and the history of Poznań, but it is also one of its citizens' favorite recreational and leisure parts. The Scouts' Monument was erected between WW I and WW II, and *Kopiec Wolności* was raised in the years 1919 and 1922, on the model *Kopiec Kościuszki* from Krakow to serve as the saint symbols of the Polish national identity for the Poznań citizens. A large estate with a broad park owned by the Mycielski family also used to be situated there. Another small park located on the east edge of the ecological land in Antoninek, belonged to the Stablewski family, until WW II. In the year 1952 a landscape-forest park, together with the Malta lake (a dammed reservoir originating from the Cybina river water lifting) were created on Malta. Nowadays, Malta lake and its vicinity constitute a recreational and leisure center equipped with the best rowing and kayaking lines in Europe, as well as a tobogganing line and a whole-year ski slope. In its vicinity, there is also one of the biggest zoos in the country [Szafran 1959, Maluśkiewicz 2000].

As the documentation of the 'Olszak I, II' ecological land was incomplete, the main aim of the author was to conduct an inventory of its flora, and then to evaluate its floristic values, on the basis of the obtained data.

THE HISTORY OF THE FLORISTIC EXAMINATIONS CONDUCTED IN THE CYBINA VALLEY AND ITS VICINITY

Many naturalists worked on the area of the present 'Olszak I, II' ecological land. Their publications, not published works, as well as herbarium sheets, collected in the herbarium of the Department of Plant Taxonomy at the Adam Mickiewicz University in Poznań, but also in the Wielkopolskie herbarium, provide a lot of information about the flora of the Cybina valley and its vicinities i.e. Malta, Olszak Młyn, Nowy Młyn and Kobylepole.

The most numerous are the oldest works of Adamski [1828], Ritschl [1850], Schönke senior (1840, 1845, 1850, 1851, 1854-1856), Szafarkiewicz (1846-1864, 1871), Cybichowski (1855, 1857, 1858), Pfuhl (1874, 1883-1885, 1888, 1889, 1894-1896, 1898, 1900, 1901, 1904, 1905), Mielke (1880, 1888), Miller (1880, 1885-1895), Vorwerk (1882, 1883, 1885, 1886, 1888, 1889), Hempel (1883, 1886, 1888) oraz Schönke junior (1887-1891, 1893) [according to Jackowiak 1993]. Krawiec (1922-1926, 1927, 1930, 1933) [1935], Sławiński (1926), Paczowski (1928), Łukowska (1931, 1934-1936) [1937], Danowska (1932), Rafalski and Urbański [1932], Wodziczko et al. [1938] and Grosse (1941) conducted their research between WW I and WW II. Szweminówna [1949], Krawiec (1951), Szulczewski [1951], Szafran [1959] and Rudnicka [1963] gathered their floristic data after WW II. Finally, the latest information about this site is provided by: Denisiuk [1980], Jackowiak [1990, 1993], Grotek [2000], Jaroszyk [2001], Śliwa and Jackowiak [2002] and Wrońska-Pilarek et al. [2002].

There is a full documentation of the localities of the rare and endangered taxons of the described area. Such data is provided by Schönke senior (1840, 1845, 1851), Ritschl [1850], (1851), Pfuhl (1874, 1885, 1890, 1900, 1904), Vorwerk (1885), Miller (1885, 1886, 1887, 1889, 1892, 1894), [1895], Hempel (1886, 1888), Schönke junior (1888, 1891), Łukowska (1935), [1937], Wodziczko et al. [1938], Grosse [1941], following Jackowiak [1993].

Jackowiak [1992] used the above stated information, as well as other sources, to create a list of the extinct species within the area of Poznań. On the area of the present 'Olszak I, II' ecological land such group is made of: *Anagalis minima*, *Andromeda polifolia*, *Carex dioica*, *C. echinata*, *Epilobium obscurum*, *Eriophorum vaginatum*, *Leersia orysoides*, *Luzula palescens*, *Marrubium vulgare*, *Minuartia viscosa*, *Pinguicula vulgaris*, *Salix staerkeana*, *Senecio congestus*, *Stellaria crassifolia* (Nowy Młyn), *Asplenium trichomanes*, *Ledum palustre*, *Linaria arvensis*, *Melampyrum nemorosum*, *Stachys recta* (Olszak Młyn), *Geranium columbinum* (Olszak), *Camelina sativa*, *Sanicula europaea*, *Sedum villosum*, *Chimaphila umbellata*, *Lycopodium annotinum*, *Pulsatilla patens* (Kobylepole), *Galeopsis speciosa* (dolina Cybiny, Kobylepole), *Radiola linoides* (Kobylepole, Nowy Młyn), *Avenula pratensis* (Kobylepole, Malta), *Botrychium lunaria*, *Callitriche palustris* (Malta) and *Hypericum montanum* (Cybina valley).

It is highly probable that in the last few decades, many other species ceased to exist there. Despite an intense search, the author was unable to find the localities of *Dianthus superbus*, *Nymphaea alba*, *Platanthera bifolia*, *Polypodium vulgare* and *Pulsatilla pratensis*, occurring on this area until 1980. According to Gołdyn [2002, unpubl. data], *Nymphaea alba* used to grow on the Olszak and Młyński ponds, but disappeared after they had been dredged in years 1995 and 1997. Also *Lemna gibba* was not found on the Browarny pond, where it used to exist before its dredging in 1996. 1990 also faced the

disappearance of the *Trollius europaeus* stand at the Antoninek pond. However, the above mentioned species cannot be considered extinct. Their search should be continued in the next growing seasons.

STUDY AREA

The 'Olszak I, II' ecological land is situated in the Cybina river valley, in the eastern part of the city of Poznań. Administratively it belongs to the Poznań – Nowe Miasto parish and district. Only its small (14 ha) fragment belongs to Swarzędz. The examined area borders the Malta, Kobylepole, Nowy Młyn and Antoninek districts. The land is split in two by Browarna street. The whole site covers the area of 229.75 ha ('Olszak I' – 93.75 ha, 'Olszak II' – 136 ha). Its water system axis is constituted by the river Cybina. It has two little tributaries; Bielinka with its tributary, Kaczeniec and Struga, together with its old tributary Darzynka. Its stagnant water reservoirs are mainly man-made. These are the four dammed reservoirs situated in the course of the Cybina river, (Antoninek, Młyński, Browarny and Olszak ponds), two clay-pits and four fish ponds located in the zoo. The periodical drownings located in the Struga upper course are the only natural reservoirs. Gołdyn [Wrońska-Pilarek et al. 2002] prepared a more detailed characteristics of all the waters situated within the site. The borders and waters of both sides of the site are shown in the figures 1A and 1B. Most of the ecological land area is administered by the Board of the Poznań Urban Green Areas. The central part of land is administered by RDSF in Poznań, which belongs to the Babki Forest District, Babki limit [Raport... 1994].

METHODS

The flora of the 'Olszak' ecological land was inventoried between March and October 2002. The species names of the plants were given according to Mirek et al. [1995], the names of arborescent plants were updated according to Seneta and Dolatowski [2000].

The statistical characteristic of the flora was conducted on the basis of the works of Jackowiak [1993] and Żukowski et al. [1995]. The only change was introduced in the appearance of frequency classes of certain species. Thus there were: I – very rare (1-5), II – rare (6-10), III – frequent (11-20), IV – very frequent (21-40), V – common (> 40 localities).

The sociological-ecological classification was given according to Jackowiak [1993]. The 'special care taxons' were classified according to widely applied domestic and foreign standards for the protection of flora [Lucas and Synge 1978, Olaczek 1985, Ławrynowicz and Olaczek 1988]. This group was made of all the legally protected species in Poland and the red-list species from Poland [Lista roślin... 1992], and Wielkopolska [Żukowska and Jackowiak 1995], as well as of the endangered species in the city of Poznań [Jackowiak 1993]. Because of the local character of this research, the species were divided according to the degree of endangerment created by Żukowski and Jackowiak [1995] and Jackowiak [1993], for Wielkopolska and Poznań (P – potentially liable to danger, PR – potentially endangered).

The ecological land was divided into 16 trial areas for the examination of the breast-height of the tree stands. Each of them had 0.25 ha. All trees with the breast-height equal or wider, then 15 qualified for the examination. The inventory of the widest trees was conducted by a belt inspection of the tree stands, along 50 meter-wide north-south transects on the whole site. The trees were divided into two categories: monumental measure trees [Instrukcja... 1996, species not qualified according to Ruciński 1998], as well as the trees with almost monumental measures, with girths from 90 to 99 cm – *Prunus avium*, *Padus racemosa*, from 140 to 159 cm – *Pyrus communis*, from 160 to 179 cm – *Acer campestre*, from 180 to 199 cm – *Carpinus betulus*, from 200 to 219 cm – *Ulmus laevis*, *Acer platanoides*, from 200 to 224 cm – *Alnus glutinosa*, from 220 to 249 cm – *Fraxinus excelsior*, *Acer pseudoplatanus*, *Platanus ×acerifolia*, from 270 to 299 cm – *Robinia pseudoacacia*, *Aesculus hippocastanum*, from 280 to 309 cm – *Pinus sylvestris*, *Salix* sp., *Tilia cordata*, from 340 to 379 cm – *Quercus robur*, *Populus ×canadensis*, *P. alba*, *P. nigra*. The trees health conditions were assessed according to the classification of Kamiński and Czerniak [2000]. The approximate age of the trees was estimated on the basis of the assessing description form 1993.

RESULTS

The general characteristics of the flora

The whole area of 'Olszak I, II' and its vicinity consisted of 570 taxons from 92 families and 314 genera. There were 7 species of pheriodophytes, 5 coniferous and 558 monocotyledones and bicotyledones. There were between 1 and 57 species in each family. The most numerous families were *Asteraceae*, *Poaceae*, *Rosaceae* and *Fabaceae*, also *Caryophyllaceae*, *Scrophulariaceae*, *Lamiaceae*, *Brassicaceae*, *Apiaceae*, *Salicaceae*, *Polygonaceae*, *Ranunculaceae*, *Cyperaceae* and *Boraginaceae*. 371 species, which make 65.1% of all vascular species on the site, came from these families. There was usually a small number of species in each family. There were only 9 families with more than 20 species. 72 from the distinguished families consisted of 1 to 5 species, and 35 families were represented only by one species.

As for the number of localities, the most numerous were the very rare and rare species – 87%. The frequent, very frequent and common species constituted 13% of the all flora (Fig. 2). The most common species of vascular plants belonged to the native species with 444 species (78% of all the taxons). 170 of those species were semisynanthropic spontaneophytes, and 274 species are apophytes.

On the examined area, there were 126 foreign taxons, accounting for 22% of all the flora. 111 of the introduced species (19%), were the permanently settled archeophytes and kenophytes, the remaining 15 species (3%), were efemerophytes. The most numerous life forms were the hemikryptophytes (233 species). Little less frequent were terophytes (115 species) and fanerophytes (105 species). There were also kryptophytes (88 species). The least frequent were chamephytes with 29 species (Fig. 3). All the species of 'Olszak I, II' belonged to 16 sociological-ecological groups. Each group consisted of 6 to 94 species (1.1-16.5%). Most of them belonged to 9 sociological-ecological groups, which made up over 5% of all the species. These groups were represented by 30 to 94 species. From 6 to 26 species belonged to the remaining groups. The most numerous

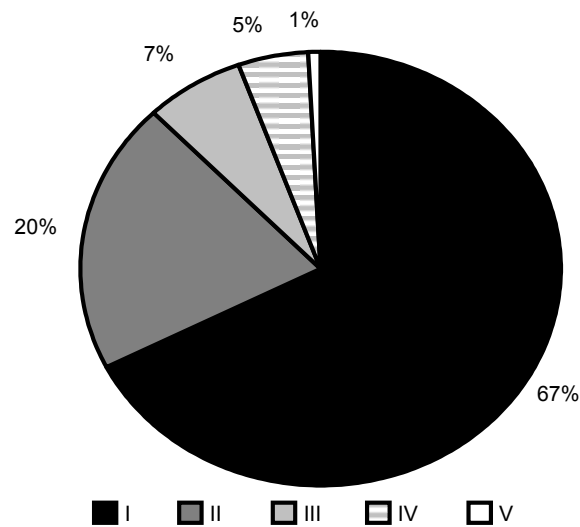


Fig. 2. The percentage participation of species in the classes of frequency. I – very rare (1-5 localities), II – rare (6-10), III – frequent (11-20), IV – very frequent (21-40), V – common (> 40)

Rys. 2. Procentowy udział gatunków w stopniach częstości. I – bardzo rzadki (1-5 stanowisk), II – rzadki (6-10), III – częsty (11-20), IV – bardzo częsty (21-40), V – pospolity (> 40)

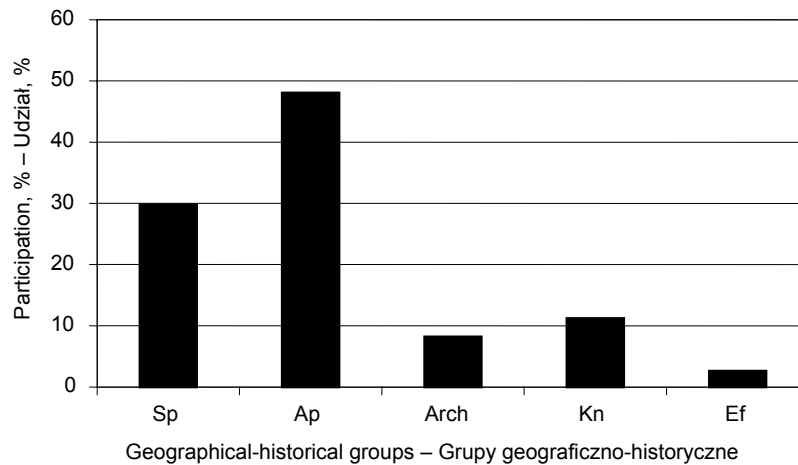


Fig. 3. The percentage participation of species in the geographical-historical groups. Sp – spontaneophytes, Ap – apophytes, Arch – archoephytes, Kn – kenophytes, Ef – efemerophytes

Rys. 3. Procentowy udział gatunków w grupach geograficzno-historycznych. Sp – spontaneofity, Ap – apofity, Arch – archeofity, Kn – kenofity, Ef – efemerofity

species on the floral list of the examined area were species belonging to the following syntaxons: *Fagetalia*, *Prunetalia*, *Salicion*, *Phragmition*, *Glycerio-Sparganion*, *Potametea*, *Lemnetea*, *Utricularietea*, *Corynephoretea*, *Sedo-Scleranthetea* and *Molinio-Arrhenatheretea*. There were also quite a few species connected with *Quercion*, *Epilobion*, *Nardetalia* and *Onopordion*, *Molinetalia* and *Alnion*, *Magnocaricion*, *Caricetalia fuscae* and *Sphagnion fusci*. The representatives of *Trifolio-Geranietea* and *Festuco-Brometea* were also numerous. *Bidentetea* and *Nanocyperion* were the least represented syntaxons (Fig. 4).

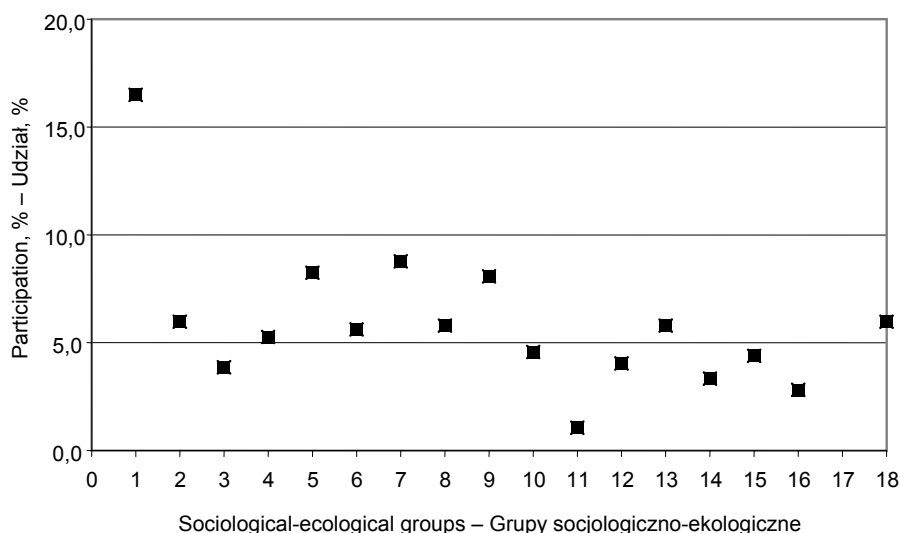


Fig. 4. The percentage participation of species in the sociological-ecological groups [according to Jackowiak 1993]

Rys. 4. Procentowy udział gatunków w grupach socjologiczno-ekologicznych [według Jackowiaka 1993]

Rare and endangered species – special care species

182 taxons of the ‘Olszak I, II’ ecological lands are on the red lists of rare and endangered species, mainly on the list made by Jackowiak [1993] for the city of Poznań – 176 species. These are ‘the special care’ species. 14 of them are legally protected, 10 are endangered and threatened in the Wielkopolska region [Rozporządzenie... 2001, Żukowski and Jackowiak 1995] (Table 1). Three are strictly protected, the rest of them are under partial protection schemes. Only *Daphne mezereum* is rare in Wielkopolska. The remaining species are not endangered in the region or in the country. On the whole Poznań area, there are 10 species which are either directly endangered, potentially liable to danger or dying out. Four of them are not endangered at all. 4 of those 10 regionally endangered species have the rare plant status, another 6 are endangered [Żukowski and Jackowiak 1995] (Table 1).

Table 1. The list of rare and endangered species. 1-14 – legally protected species, 3, 6, 11 – strict protection, * species unthreatened in the region, – species not listed on the red list

Tabela 1. Lista gatunków rzadkich i zagrożonych. 1-14 – gatunki objęte ochroną prawną, 3, 6, 11 – ochrona ścisła, * gatunek niezagrożony w regionie, – gatunek nie odnotowany na czerwonej liście

No Lp.	Species name Nazwa gatunkowa	Category of threat Kategoria zagrożenia	
		Poznań	Wielkopolska
1	<i>Asarum europaeum</i> L.	V	*
2	<i>Convallaria majalis</i> L.	P1	*
3	<i>Daphne mezereum</i> L.	E	R
4	<i>Dianthus carthusianorum</i> L.	–	–
5	<i>Dianthus deltoides</i> L.	–	–
6	<i>Epipactis helleborine</i> (L.) CRANTZ	–	*
7	<i>Frangula alnus</i> MILL.	P1	*
8	<i>Helichrysum arenarium</i> (L.) MOENCH	–	*
9	<i>Hepatica nobilis</i> Miller	V	–
10	<i>Menyanthes trifoliata</i> L.	P1	–
11	<i>Nuphar lutea</i> (L.) SIBTH. & SM.	V	*
12	<i>Primula veris</i> L.	V	*
13	<i>Ribes nigrum</i> L.	P1	*
14	<i>Viburnum opulus</i> L.	P1	*
15	<i>Acer campestre</i> L.	*	R
16	<i>Androsace septentrionalis</i> L.	V	V
17	<i>Betonica officinalis</i> L.	V	V
18	<i>Corydalis intermedia</i> (L.) MÉRAT	V	R
19	<i>Crataegus rhipidophylla</i> GAND.	I	R
20	<i>Cuscuta epithimum</i> (L.) L.	V	V
21	<i>Cynosurus cristatus</i> L.	V	V
22	<i>Populus nigra</i> L.	*	R
23	<i>Silvaum silaus</i> (L.) SCHINZ & THELL.	P1	V
24	<i>Wolffia arrhiza</i> (L.) HORKEL ex WIMM.	Ex	V

Most of 'the special care' species are either potentially liable to danger (55%) or directly endangered (30%). Other categories constitute 15% of all the species (Fig. 5). Those plants have few localities. These are usually very rare (70%) and rare (17.2%) species. Other categories, frequent, very frequent and common species, make up a slight percentage of 12.8% of all the species. The described plants are usually connected with the community of *Fagetalia* and *Prunetalia* also *Salicion*, *Phragmition*, *Glycerio-Sparganion*, *Potametea*, *Lemnetea*, *Utricularietea* and *Molinietalia*, *Alnion*, *Magnocaricion*, *Caricetalia fuscae* and *Sphagnion fusci*, they are less frequent on *Quercion*, *Epilobion*, *Nardetalia* and *Molinio-Arrhenatheretea*.

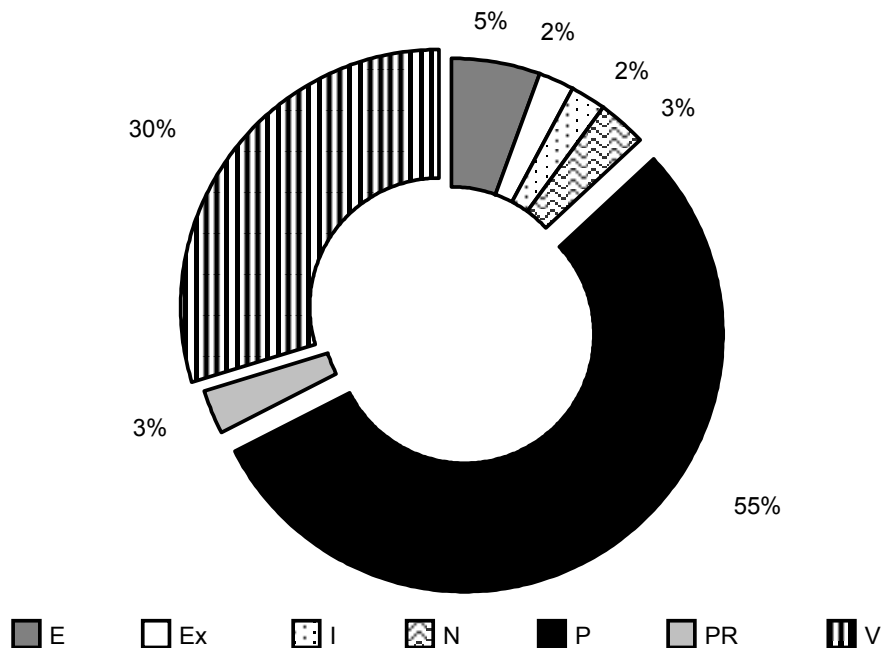


Fig. 5. The percentage participation of rare and endangered species in Poznań in the categories of threat. Ex – extinct-missing, E – dying out, V – endangered, P – potentially liable to danger, PR – potentially endangered, I – endangered uncertain, N – unthreatened
Rys. 5. Procentowy udział gatunków rzadkich i zagrożonych w Poznaniu w kategoriach zagrożenia. Ex – wymarłe, E – wymierające, V – zagrożone, P – potencjalnie narażone, PR – potencjalnie zagrożone, I – zagrożone niepewne, N – niezagrożone

On the examined area, there were found few species considered extinct in Poznań, as their localities hadn't been confirmed for a long time (*Callitriche palustris*, *Equisetum sylvaticum*, *Melampyrum nemorosum* and *Wolffia arrhiza*). These were *Callitriche palustris* from Malta, following Schönke junior (1891). *Equisetum sylvaticum* was last described by Łukowska [1937] from Olszak Młyn. *Melampyrum nemorosum* stand from Olszak Młyn was cited by Miller (1885), Schönke junior (1888) and Łukowska (1935), [1937]. *Wolffia arrhiza* was not found on this area. The only stand of *W. arrhiza* in the city of Poznań was situated at the Kierskie lake [Kulesza 1920, Urbański 1930, Wod-

ziczko et al. 1938, Szulczewski 1951]. *Daphne mezereum*, *Geranium sanguineum*, *Impatiens noli-tangere*, *Lathraea squamaria*, *Mercurialis perennis*, *Pulmonaria obscura*, *Rhinanthus serotinus*, *Rosa rubiginosa*, *Silene nutans* and *Trifolium montanum* localities in our city were also confirmed [Grotek 2000, Gołdyn 2002, unpubl. data, Stasik 2002, unpubl. data].

DENDROFLORA

Wrońska-Pilarek and Stasik [Wrońska-Pilarek et al. 2002] examined the dendroflora of 'Olszak I, II'. It consisted of 104 taksons, which accounted for 18.2% of all the flora of the examined site. 50 of those taxons were trees, 46 shrubs, and 8 were made of plants with both of those forms of growth. The least transformed tree stands remained mainly in the riparian, alder carr, and dry-ground forests, situated in the Cybina valley and its vicinity. The species composition of the tree stands was dominated by the Scots pine and the common birch. The deciduous trees from the dynamic oak-dry-ground as well as riparian and alder carr trees were also very common.

The average tree stands from the 'Olszak' site was 63 years old. Most of the tree stands were either young or middle aged. The youngest tree stands were a few years old, the oldest were around 160. 1535 trees qualified for the breast-high analysis. Their breast-heights were between 15.0 and 91.0 cm. The majority of the trees (992), were in the width-class between 15.0 and 29.0 cm. Trees from the 29.1 to 45.0 cm width-class were also very common (478). The widest trees were also the least frequent. There were only 36 trees in the 51.1 to 91.0 cm width-class (Fig. 6).

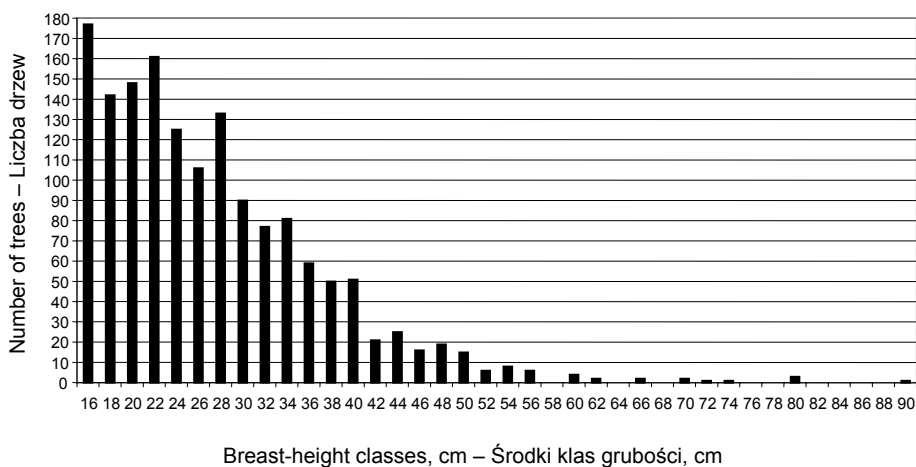


Fig. 6. The breast height structure of the trees defined on the basis of 16 trial areas
Rys. 6. Struktura pierśnic drzew przedstawiona na podstawie 16 powierzchni próbnych

The dendroflora of this land is highly anthropopressed. As far as the natural structure of the tree stands is considered, *Populus ×canadensis*, *Quercus rubra*, *Robinia*

pseudoacacia, and *Prunus serotina* are the unwelcome species which cover large parts of the land. The high degree of deformation of the dendroflora species composition of the examined area is visible in the high number of the introduced species, which also include (apart from those mentioned above) *Aesculus hippocastanum*, *Cornus alba* i *C. mas*, *Fraxinus pennsylvanica*, *Ligustrum vulgare*, *Lonicera tatarica*, *Morus alba*, *Pinus nigra*, *Populus nigra* 'Italica', *Prunus cerasifera* or *P. mahaleb*. There are also native species, planted outside their natural range of extent, such as *Fagus sylvatica*, *Larix decidua*, *Picea abies*, *Tilia platyphyllos* and *Sorbus intermedia*.

The dendroflora of 'Olszak' is distinguished by a high number of monumental measure trees. 76 most valuables out of 107 such trees are legally protected as nature monuments. *Platanus ×acerifolia* is the only one tagged monumental tree (trunk girths 352/273 cm). Monumental measures are usually obtained by the trees growing in rich deciduous forests (Table 2).

Table 2. Number of trees of individual species suggested for legal protection as nature monuments

Tabela 2. Liczba drzew poszczególnych gatunków proponowanych do objęcia ochroną w formie pomników przyrody

Species name Nazwa gatunkowa	Number of trees Liczba drzew
<i>Salix fragilis</i>	1
<i>Acer platanoides</i>	16
<i>Acer pseudoplatanus</i>	2
<i>Carpinus betulus</i>	2
<i>Alnus glutinosa</i>	20
<i>Quercus robur</i>	2
<i>Pyrus communis</i>	4
<i>Ulmus laevis</i>	9
<i>Ulmus glabra</i>	8
<i>Fraxinus excelsior</i>	6
<i>Robinia pseudoacacia</i>	1
<i>Acer campestre</i>	2
<i>Aesculus hippocastanum</i>	2
<i>Tilia cordata</i>	1
TOTAL – RAZEM	76

The flora of 'Olszak' is subjected to anthropopressure, which is manifested by:

– the most common native species are apophytes (48%), which prevail in highly transformed habitats and even achieve there their development optimum; sponataneophytes are less numerous (30%), and do not show any tendency to occupy highly transformed habitats,

– significant number of foreign taxa (22%), where the permanently settled species (archeophytes and kenophytes) are more common than those occurring periodically (efemerophytes). The persisting process of shaping the species composition of its flora, can be proven by slightly higher number of the younger foreigners – kenophytes than the older ones – archeophytes,

– but also by a slight disturbance in the basic life forms division in relation to the Raunkiaer spectrum, designed for the Polish flora by Kornaś and Medwecka-Kornaś [2002], and also with the one prepared by Żukowski et al. [1995] for the WNP Wielkopolska National Park). The differences are seen in a slightly higher number of fanerophytes (18%), and a little lower number of one-year plants – terophytes (20%). Many plants are being introduced into the land. They are dragged by its numerous visitors, strollers and bikers. Some of its species migrated there from the nearby parks and gardens, and many of them (mainly trees and shrubs) were planted there by the land administrators,

– depleted trees and shrubs species composition, frequent monocultures, very often with foreign species, significant participation of foreign trees and shrubs (44.2%), as well as introduction into the forest complexes of national tree species that do not naturally occur in the Wielkopolska region,

– retreat of many valuable species of vascular plants.

Despite all the changes caused by anthropopressure, when compared with other natural sites, the 'Olszak I, II' ecological lands possess outstanding floral values. It is vivid not only in a high number of the already described species, but also in a great percentage of legally protected plants and plants listed as rare or endangered in the Wielkopolska region and the whole country. The diversified flora of this site consists of 570 taxa of vascular plants, in relation to 1299 such species in Poznań [Jackowiak 2002]. There are also communities of tree stands close to the natural ones, situated mainly in the riparian, alder carr, and dry-ground forests situated in the Cybina valley and its vicinity. They belong to the last mainstays of the rare plant species. There are 182 species from the red list, 176 of them can be found on the list prepared for the city of Poznań. 14 of the 'special care' species are legally protected, and 10 belong to the rare and endangered species in the Wielkopolska region. 4 of the species found at the examined area were thought to be extinct in Poznań, and another 10 species are dying out. There is also a high number of monumental measure trees. They grow mainly in the area of a former park, which used to belong to the Mycielski family.

Recently, in the 'Olszak II' ecological land, four 'special care' species not described in this study, were found. These are: the protected species – *Listera ovata*, as well as *Corydalis cava*, *Lathraea squamaria* and *Orthilia secunda*, which is dying out in our city [Gruszczyńska 2004].

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ROŚLINY NACZYNIOWE UŻYTKU EKOLOGICZNEGO “OLSZAK I, II” W POZNANIU

Streszczenie. Pomimo zmian spowodowanych antropopresją, użytek ekologiczny „Olszak I, II” należy do obiektów wyróżniających się znacznymi walorami florystycznymi. Urozmaicona i bogata flora tego obiektu liczy 570 taksonów roślin naczyniowych. Użytek jest jedną z ostatnich w mieście ostoi rzadkich i zagrożonych gatunków roślin. Na czerwonych listach znajdują się 182 gatunki, z tego 176 gatunków na liście sporządzonej dla miasta Poznania. Z gatunków „specjalnej troski” 14 podlega ochronie prawnej, a 10 należy do rzadkich i zagrożonych w Wielkopolsce. Na badanym obszarze udało się odnaleźć 4 gatunki uznane w Poznaniu za wymarłe oraz potwierdzić występowanie 10 gatunków wymierających. Badany użytek wyróżnia się znacznym udziałem drzew o wymiarach pomnikowych. Występuje tu ponad 100 takich drzew. Do ochrony w formie pomników przyrody wybrano 76 najcenniejszych okazów.

Słowa kluczowe: rośliny naczyniowe, flora, użytek ekologiczny, Poznań

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