



## VASCULAR FLORA OF THE PALACE PARK IN MIŁOSŁAW (WIELKOPOLSKA)

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**ABSTRACT.** The paper contains a list of vascular plant identified in the palace park in Miłosław. The study focused on species introduced a long time ago, which have survived till the present times and those, which have been recently planted. A total of 270 species of vascular plants were identified, including 43 trees, 44 shrubs and 183 herbaceous plants. Among herbaceous species, which were introduced to cultivation the earliest, we need to mention especially *Angelica archangelica*, *Anthriscus cerefolium*, *Corydalis cava*, *Geranium pyrenaicum*, *Leonurus cardiaca*, *Petasites hybridus*, *Polygonatum multiflorum*, *Ranunculus friesianus*, *Telekia speciosa* and *Viola odorata*.

**KEY WORDS:** flora of vascular plants, park, Miłosław, the Wielkopolska region

### INTRODUCTION

The town of Miłosław is located in the Wielkopolskie province, 54 km south-east of Poznań, surrounded by ponds, on the little river Miłosławka, a left tributary of the Moskawa, further flowing into the river Warta. It lies in the southern part of the Września Plain, on a hummock of the Miłosław Esker at an altitude of approx. 90 above the sea level at the Września-Jarocin and Pызdry trunk roads and the Gniezno-Jarocin railway line. The town covers the area of 4.1 km<sup>2</sup> and has almost 3600 inhabitants. It is the seat of the Commune Office. The name of the town stems from the Old Polish name Miłosław, the name of an otherwise unknown founder of the settlement and probably its first owner (KUCHARSKI 1997).

Behind the crossroads, at the closure of the axis of the medieval town plan, there is a vast park with a palace, the former seat of the Miłosław estate owners. The main entrance to the park leads to an ornamental, neo-Gothic brick gate, with a wrought iron grille with Baroque motifs, renovated in 1995. In 1996 the park started to be surrounded with a stylized wrought iron fence. Next to the gate there is a former house of the park keeper, called the gardener's cottage, built in 1854. It is an irregular and partly buttressed building, with a one-storey central part and a round tower, today unfortunately lowered, no longer constituting a dominant accent. In the park, on a small elevation, there is an impressive palace, in front of which extends a vast carpet lawn, forming a kind of front palace courtyard. The impressive palace has a complex mass, which is the result of numerous alterations and expansions, although

conducted consistently in order to ensure a harmonious effect (LIBICKI and LIBICKI 2003). Next to the palace, on its eastern side, there is a one-storey, neo-Gothic outbuilding, consisting of several masses supported by buttresses. In the vicinity of the outbuilding, opposite a side entrance gate to the park from the side of the Zamkowa Street there is a former coachman's house (living quarters for farm labourers), built in mid-1800, constituting a section of buildings of Bugaj (KUCHARSKI 1997).

The palace is surrounded by a vast landscape park, considered one of the most beautiful in the Wielkopolska region. Established in the beginning of the 19th century, in mid-1800 it was enlarged by Seweryn Mielżyński and established in the style of English Romantic parks, while at the turn of the 19th and 20th centuries it was again enlarged by Józef Kościelski, who also introduced (following the fashion of that time) certain regular elements in the area around the palace (the pattern of roads and flower beds). Today the park is irregularly polygonal in shape, elongated in the westerly direction and covers 37.80 ha (including 6 ha of waters). In its eastern part the park is criss-crossed by four picturesque canals, supplying water to a pond of over 5 ha, located in the central western part, with three wooded islands, of which the biggest was formed as a result of canal digging. Beautiful paths run through the park and quaint little bridges are thrown over the canals. The stand of the park is composed mainly of native species, although there are also exotic trees there. When enlarging the park, Seweryn Mielżyński took advantage of the natural conditions and the previously existing stand, thus there are impressive trees growing there, much older than the park itself. The park is also decorated by

avenues. The main avenue – of hornbeams and lindens – runs from the north to the south, towards a wooden cross, standing outside the park on a hill, at a road to a former forester's lodge called Bagatelka. Another avenue, composed of hornbeams, leads towards a monument of a famous Polish poet, Juliusz Słowacki. A wide avenue, composed of four rows of larch trees, running from the east to the west on the southern side of the pond, crossed by a perpendicular larch and spruce avenue, is also of exceptional beauty. Starting from 1990 renovation works have been conducted in the Miłosław park, with the aim of restoring its former magnificence (KUCHARSKI 1997).

A splendid, beautiful specimen of common oak *Quercus robur* named "Dąb Słowackiego" [Słowacki's oak] is growing in the Miłosław palace park. The following entry has been preserved to our times in the chronicle of the Miłosław palace: "This oak was planted by [King] Kazimierz Wielki in the year 1364..." (KACZMAREK 1974, 1993). Among several *Ginkgo biloba* trees in the Wielkopolska region, the one in Miłosław is undoubtedly the oldest, the most magnificent and the most beautiful (KACZMAREK 1967). There was also information on the incidence of bald cypress *Taxodium distichum* (KACZMAREK 1968), which is no longer found there. Floristic studies on Miłosław and its environs (GIŻEWSKI 1960, KACZYŃSKA 1964) are available, which did not cover the palace park.

## MATERIAL AND METHODS

Floristic studies were conducted in the palace park in Miłosław in the vegetation season of 2007.

In order to determine the frequency of species, a 5-point scale was applied: 1 – a very rare species (covering < 5% park area), 2 – a rare species (5-25%), 3 – a moderately frequent species (25-50%), 4 – a frequent species (50-75%) and 5 – a very frequent species (75-100%). Geographic-historical and socioecological groups are presented following CHMIEL (1993), with slight modifications, while Raunkiaer's life forms are given after ZARZYCKI et AL. (2002).

Nomenclature of species was adopted after MIREK et AL. (2002). Collected trees and shrubs were identified by a specialist, Prof. dr hab. Jerzy Zieliński of PAS, Kórnik, who we would like to thank very much here for his invaluable help.

## RESULTS

A total of 252 vascular plant species were identified in the palace park in Miłosław (Table 1).

When analysing the frequency of species it needs to be stated that the most numerous group is represented by very rare species. It comprises 204 species, which account for 75.55% total flora, while frequent and very

TABLE 1. The list of vascular plant species identified in the palace park in Miłosław

Taxon	Frequency classes	GGH	GFŻ	GSE
1	2	3	4	5
Tree layer				
<i>Abies alba</i> Mill.	1	Dia	M	2
<i>Abies concolor</i> (Gordon & Glend) Lindl. ex Hildebr.	1	Cul	M	19
<i>Acer campestre</i> L.	1	Ap	M	1
<i>Acer negundo</i> L.	1	Ken	M	3
<i>Acer platanoides</i> L.	2	Ap	M	1
<i>Acer pseudoplatanus</i> L.	1	Ap	M	1
<i>Acer saccharinum</i> L.	1	Dia	M	19
<i>Aesculus hippocastanum</i> L.	2	Ken	M	19
<i>Ailanthus altissima</i> Swingle	1	Cul	M	19
<i>Alnus glutinosa</i> (L.) Gaertn.	2	Sp	M	6
<i>Betula pendula</i> Roth	1	Ap	M	2
<i>Carpinus betulus</i> L.	2	Sp	M	1
<i>Carya laciniata</i> (F. Michx.) Loudon	1	Dia	M	19
<i>Celtis occidentalis</i> L.	1	Dia	M	19
<i>Chamaecyparis pisifera</i> Endl. 'Squarosa'	1	Dia	M	19
<i>Fagus sylvatica</i> L.	1	Sp	M	1
<i>Fraxinus excelsior</i> L.	2	Ap	M	1
<i>Ginkgo biloba</i> L.	1	Dia	M	19
<i>Juglans regia</i> L.	1	Dia	M	19
<i>Larix decidua</i> Mill.	1	Sp	M	2
<i>Liriodendron tulipifera</i> L.	1	Cul	M	19
<i>Malus domestica</i> Borkh.	1	Dia	M	19
<i>Metasequoia glyptostroboides</i> Hu & W.C. Cheng	1	Cul	M	19

1	2	3	4	5
<i>Picea abies</i> (L.) H. Karst.	1	Ken	M	2
<i>Picea pungens</i> Engelm.	1	Cul	M	19
<i>Pinus nigra</i> J.F. Arnold	1	Dia	M	5
<i>Pinus strobus</i> L.	1	Dia	M	5
<i>Pinus sylvestris</i> L.	3	Ap	M	5
<i>Populus nigra</i> L.	1	Ap	M	7
<i>Populus tremula</i> L.	2	Ap	M	2
<i>Prunus cerasifera</i> Ehrh.	2	Ken	M	19
<i>Pseudotsuga menziesii</i> (Mirb.) Franco	1	Dia	M	2
<i>Pyrus pyraister</i> (L.) Burgsd.	1	Ap	M	1
<i>Quercus petraea</i> (Matt.) Loeb.	1	Sp	M	2
<i>Quercus robur</i> L.	1	Sp	M	1
<i>Quercus rubra</i> L.	1	Ken	M	2
<i>Robinia pseudoacacia</i> L.	2	Ken	N	14
<i>Salix alba</i> L.	1	Ap	M	7
<i>Thuja occidentalis</i> L.	1	Dia	M	19
<i>Tilia cordata</i> Mill.	2	Ap	M	1
<i>Tilia xeuclora</i> K. Koch	1	Dia	M	19
<i>Tilia platyphyllos</i> Scop.	2	Ap	M	1
<i>Ulmus laevis</i> Pall.	1	Ap	M	1
Shrubby layer				
<i>Acer platanoides</i> L.	2	Ap	M	1
<i>Acer pseudoplatanus</i> L.	1	Ap	M	1
<i>Berberis thunbergii</i> DC.	1	Cul	N	19
<i>Buxus sempervirens</i> L.	1	Cul	N	19
<i>Calystegia sepium</i> (L.) R. Br.	1	Sp	G	7
<i>Caragana arborescens</i> Lam.	1	Dia	N	19
<i>Cornus sanguinea</i> L.	1	Sp	N	1
<i>Corylus avellana</i> L.	1	Sp	N	1
<i>Crataegus monogyna</i> Jacq.	1	Ap	N	1
<i>Deutzia scabra</i> Thunb.	1	Dia	N	19
<i>Euonymus europaeus</i> L.	1	Ap	N	1
<i>Forsythia xintermedia</i> Zabel	1	Cul	N	19
<i>Frangula alnus</i> Mill.	1	Sp	N	6
<i>Fraxinus excelsior</i> L.	2	Ap	M	1
<i>Hedera helix</i> L.	2	Ap	Ch	1
<i>Humulus lupulus</i> L.	2	Sp	H	7
<i>Juniperus chinensis</i> L.	1	Cul	N	19
<i>Juniperus xfitzeriana</i> (L. Späth) P.A. Schmidt	1	Cul	N	19
<i>Ligustrum vulgare</i> L.	1	Ken	N	19
<i>Liriodendron tulipifera</i> L.	1	Cul	M	19
<i>Lonicera maackii</i> (Rupr.) Herder	1	Cul	N	19
<i>Lonicera xylosteum</i> L.	1	Ap	N	1
<i>Mahonia aquifolium</i> (Pursh) Nutt.	1	Cul	N	19
<i>Padus avium</i> Mill.	1	Sp	M	1
<i>Parthenocissus inserata</i> (A. Kern.) Fritsch	1	Cul	N	19
<i>Philadelphus coronarius</i> L.	1	Dia	N	19
<i>Physocarpus opulifolius</i> (L.) Maxim.	1	Cul	N	19
<i>Prunus cerasifera</i> Ehrh.	2	Ken	M	19
<i>Quercus rubra</i> L.	1	Ken	M	2
<i>Rhamnus cathartica</i> L.	1	Sp	N	1
<i>Ribes alpinum</i> L.	1	Sp	N	19
<i>Rosa canina</i> L.	1	Ap	N	4
<i>Rosa rugosa</i> Thunb.	1	Dia	N	19
<i>Rubus caesius</i> L.	2	Ap	Ch	13

1	2	3	4	5
<i>Rubus idaeus</i> L.	2	Sp	N	2
<i>Salix cinerea</i> L.	1	Sp	N	6
<i>Salix fragilis</i> L.	1	Ap	M	7
<i>Sambucus nigra</i> L.	2	Ap	N	3
<i>Sorbus aucuparia</i> L. emend. Hedl.	1	Sp	M	2
<i>Spiraea xvanhouttei</i> (Briot) Zabel	1	Dia	N	19
<i>Symphoricarpos albus</i> (L.) S.F. Blake	2	Ken	N	19
<i>Syringa vulgaris</i> L.	2	Ken	N	19
<i>Taxus baccata</i> L.	2	Cul	N	1
<i>Viscum album</i> L.	1	Ap	Ch	1
Herb layer				
<i>Achillea millefolium</i> L. s.s.	1	Ap	G	9
<i>Adoxa moschatellina</i> L.	2	Sp	G	1
<i>Aegopodium podagraria</i> L.	2	Sp	H	1
<i>Agrostis stolonifera</i> L.	2	Ap	H	10
<i>Ajuga reptans</i> L.	1	Sp	H	1
<i>Alisma lanceolatum</i> With.	1	Sp	Hel	7
<i>Alliaria petiolata</i> (M. Bieb.) Cavara & Grande	2	Ap	T	3
<i>Anchusa officinalis</i> L.	1	Ap	H	14
<i>Anemone nemorosa</i> L.	2	Sp	G	1
<i>Angelica archangelica</i> L.	1	Ap	H	19
<i>Anthoxanthum odoratum</i> L. s.s.	1	Ap	H	2
<i>Anthriscus cerefolium</i> Hoffm.	1	Ken	T	19
<i>Anthriscus sylvestris</i> (L.) Hoffm.	1	Ap	H	3
<i>Arctium tomentosum</i> Mill.	1	Ap	T	13
<i>Arenaria serpyllifolia</i> L.	1	Ap	T	5
<i>Armoracia rusticana</i> P. Gaertn., B. Mey. & Scherb.	1	Arch	H	13
<i>Arrhenatherum elatius</i> (L.) P. Beauv. ex J. Presl & C. Presl	2	Ap	H	9
<i>Artemisia vulgaris</i> L.	1	Ap	H	13
<i>Asarum europaeum</i> L.	1	Sp	H	1
<i>Astragalus glycyphyllos</i> L.	1	Ap	H	2
<i>Athyrium filix-femina</i> (L.) Roth	1	Sp	H	1
<i>Atriplex patula</i> L.	1	Ap	T	16
<i>Ballota nigra</i> L.	2	Arch	H	14
<i>Bellis perennis</i> L.	1	Sp	H	9
<i>Bidens frondosa</i> L.	1	Ken	T	12
<i>Brachypodium sylvaticum</i> (Huds.) P. Beauv.	2	Sp	H	1
<i>Bromus carinatus</i> Hook. & Arn.	1	Ken	H	10
<i>Bromus hordeaceus</i> L.	2	Ap	T	14
<i>Bromus inermis</i> Leyss.	2	Ap	G	14
<i>Bromus sterilis</i> L.	2	Arch	T	3
<i>Calamagrostis epigejos</i> (L.) Roth	1	Ap	G	2
<i>Caltha palustris</i> L.	1	Sp	H	8
<i>Campanula patula</i> L. s.s.	1	Ap	H	9
<i>Campanula rapunculoides</i> L.	1	Ap	H	7
<i>Campanula trachelium</i> L.	1	Sp	H	1
<i>Capsella bursa-pastoris</i> (L.) Medik.	1	Arch	T	16
<i>Carex acutiformis</i> Ehrh.	2	Sp	H	6
<i>Carex riparia</i> Curtis	1	Sp	H	6
<i>Carex spicata</i> Huds.	1	Ap	H	2
<i>Carex vulpina</i> L.	1	Ap	H	8
<i>Cerastium holosteoides</i> Fr. emend. Hyl.	1	Ap	H	9
<i>Cerastium macrocarpum</i> Schur emend. Gartner	1	Sp	T	6
<i>Cerastium semidecandrum</i> L.	1	Ap	T	5
<i>Ceratophyllum demersum</i> L. s.s.	1	Sp	Hyd	7

1	2	3	4	5
<i>Chaerophyllum temulum</i> L.	2	Ap	T	3
<i>Chamomilla suaveolens</i> (Pursh) Rydb.	1	Ken	T	10
<i>Chelidonium majus</i> L.	3	Ap	H	3
<i>Cichorium intybus</i> L.	1	Arch	H	14
<i>Cirsium arvense</i> (L.) Scop.	1	Ap	G	13
<i>Cirsium oleraceum</i> (L.) Scop.	1	Sp	H	8
<i>Cirsium vulgare</i> (Savi) Ten.	1	Ap	T	13
<i>Convallaria majalis</i> L.	1	Sp	G	2
<i>Convolvulus arvensis</i> L.	1	Ap	G	14
<i>Conyza canadensis</i> (L.) Cronquist	1	Ken	T	15
<i>Coronilla varia</i> L.	1	Ap	H	4
<i>Corydalis cava</i> Schweigg. & Körte	2	Sp	G	1
<i>Crepis tectorum</i> L.	1	Ap	T	16
<i>Cucubalus baccifer</i> L.	1	Sp	H	3
<i>Cynoglossum officinale</i> L.	1	Ap	H	3
<i>Dactylis glomerata</i> L.	2	Ap	H	9
<i>Dactylis polygama</i> Horv.	1	Sp	H	1
<i>Datura stramonium</i> L.	1	Ken	T	14
<i>Deschampsia caespitosa</i> (L.) P. Beauv.	1	Sp	H	8
<i>Dryopteris filix-mas</i> (L.) Schott	1	Sp	H	2
<i>Elymus repens</i> (L.) Gould	1	Ap	G	10
<i>Epilobium ciliatum</i> Raf.	1	Ken	H	12
<i>Epilobium hirsutum</i> L.	1	Ap	H	8
<i>Equisetum arvense</i> L.	1	Ap	G	6
<i>Erodium cicutarium</i> (L.) L'Hér.	1	Ap	T	16
<i>Eupatorium purpureum</i> L.	1	Dia	H	7
<i>Festuca gigantea</i> (L.) Vill.	1	Sp	H	1
<i>Festuca rubra</i> L. s.s.	1	Ap	H	9
<i>Gagea arvensis</i> (Pers.) Dumort.	1	Arch	G	3
<i>Gagea lutea</i> (L.) Ker Gawl.	1	Sp	G	1
<i>Gagea pratensis</i> (Pers.) Dumort.	2	Ap	G	3
<i>Galeobdolon luteum</i> Huds.	1	Sp	H	1
<i>Galeopsis bifida</i> Boenn. / <i>G. tetrahit</i> L.	1	Ap	T	2
<i>Galinsoga ciliata</i> (Raf.) S.F. Blake	1	Ken	T	16
<i>Galinsoga parviflora</i> Cav.	1	Ken	T	16
<i>Galium aparine</i> L.	2	Ap	T	3
<i>Galium palustre</i> L.	1	Sp	H	6
<i>Geranium macrorrhizum</i> L.	2	Cul	H	19
<i>Geranium molle</i> L.	1	Ken	T	14
<i>Geranium platypetalum</i> Fisch. et Mey.	1	Cul	H	19
<i>Geranium pratense</i> L.	1	Ap	H	9
<i>Geranium pusillum</i> Burm. F. ex L.	2	Arch	T	16
<i>Geranium pyrenaicum</i> Burm. F.	3	Ken	H	14
<i>Geranium robertianum</i> L.	3	Sp	T	3
<i>Geum urbanum</i> L.	2	Ap	H	3
<i>Glechoma hederacea</i> L.	2	Ap	H	3
<i>Glyceria fluitans</i> (L.) R. Br.	1	Ap	Hel	7
<i>Glyceria maxima</i> (Hartm.) Holmb.	1	Sp	Hel	7
<i>Heracleum sibiricum</i> L.	1	Ap	H	9
<i>Holcus lanatus</i> L.	2	Ap	H	8
<i>Hordeum murinum</i> L.	1	Arch	T	15
<i>Hottonia palustris</i> L.	1	Sp	Hyd	6
<i>Hydrocharis morsus-ranae</i> L.	1	Sp	Hyd	7
<i>Hypericum perforatum</i> L.	1	Ap	H	2
<i>Impatiens glandulifera</i> Royle	1	Ken	T	7

1	2	3	4	5
<i>Impatiens parviflora</i> DC.	1	Ken	T	3
<i>Iris pseudacorus</i> L.	1	Sp	Hel	6
<i>Juncus bufonius</i> L.	1	Ap	T	12
<i>Knautia arvensis</i> (L.) J.M. Coult.	1	Ap	H	2
<i>Lactuca serriola</i> L.	1	Arch	T	15
<i>Lamium album</i> L.	1	Arch	H	3
<i>Lapsana communis</i> L. s.s.	2	Ap	T	3
<i>Lemna minor</i> L.	2	Ap	Hyd	7
<i>Leontodon autumnalis</i> L.	1	Ap	H	10
<i>Leontodon taraxacoides</i> (Vill.) Mérat	1	Ap	H	5
<i>Leonurus cardiaca</i> L.	1	Arch	H	14
<i>Lepidium ruderales</i> L.	1	Arch	T	15
<i>Ligularia dentata</i> (A. Gray) H. Hara	1	Cul	H	19
<i>Lolium perenne</i> L.	1	Ap	H	10
<i>Lotus uliginosus</i> Schkuhr	2	Sp	H	6
<i>Lycopus europaeus</i> L.	1	Sp	Hel	7
<i>Lysimachia nummularia</i> L.	1	Sp	H	1
<i>Lythrum salicaria</i> L.	1	Sp	H	7
<i>Malva neglecta</i> Wallr.	1	Arch	T	14
<i>Malva sylvestris</i> L.	1	Arch	T	14
<i>Medicago lupulina</i> L.	1	Ap	H	9
<i>Melandrium album</i> (Mill.) Garcke	1	Ap	H	14
<i>Melilotus alba</i> Medik.	1	Ap	T	15
<i>Mentha aquatica</i> L.	1	Sp	Hel	7
<i>Moehringia trinervia</i> (L.) Clairv.	1	Sp	H	2
<i>Mycelis muralis</i> (L.) Dumort.	1	Sp	H	1
<i>Myosoton aquaticum</i> (L.) Moench	1	Ap	H	7
<i>Nymphaea</i> 'Atropurpurea'	1	Cul	Hyd	7
<i>Oenanthe aquatica</i> (L.) Poir.	1	Ap	T	12
<i>Onopordum acanthium</i> L.	1	Arch	T	14
<i>Papaver rhoeas</i> L.	1	Arch	T	17
<i>Petasites hybridus</i> (L.) P. Gaertn., B. Mey. & Scherb.	3	Ap	G	8
<i>Phalaris arundinacea</i> L.	1	Ap	H	7
<i>Phragmites australis</i> (Cav.) Trin. ex Steud.	2	Sp	Hel	7
<i>Pimpinella saxifraga</i> L.	1	Ap	H	9
<i>Plantago lanceolata</i> L. s.s.	1	Ap	H	10
<i>Plantago major</i> L.	2	Ap	H	10
<i>Plantago media</i> L. s.s.	2	Ap	H	9
<i>Poa annua</i> L.	2	Ap	T	10
<i>Poa pratensis</i> L. s.s.	2	Ap	H	9
<i>Poa trivialis</i> L.	2	Ap	H	12
<i>Polygonatum multiflorum</i> (L.) All.	1	Sp	G	1
<i>Polygonum aviculare</i> L.	1	Ap	T	10
<i>Polygonum persicaria</i> L.	1	Ap	T	16
<i>Potamogeton crispus</i> L.	1	Ap	Hyd	7
<i>Potentilla anserina</i> L.	1	Ap	H	10
<i>Potentilla argentea</i> L. s.s.	1	Ap	H	14
<i>Potentilla erecta</i> (L.) Raeusch.	1	Sp	H	8
<i>Puccinellia distans</i> (Jacq.) Parl.	1	Ap	H	11
<i>Ranunculus acris</i> L. s.s.	2	Ap	H	9
<i>Ranunculus acris</i> L. × <i>R. friesianus</i> Jord.	1	Sp	H	9
<i>Ranunculus friesianus</i> Jord.	3	Ken	H	9
<i>Ranunculus repens</i> L.	2	Ap	H	10

1	2	3	4	5
<i>Rumex crispus</i> L.	1	Ap	H	10
<i>Rumex hydrolapathum</i> Huds.	1	Sp	Hel	7
<i>Rumex obtusifolius</i> L.	1	Ap	H	13
<i>Rumex thyrsoiflorus</i> Fingerh.	1	Ap	H	14
<i>Sagittaria sagittifolia</i> L.	1	Sp	Hyd	7
<i>Scirpus sylvaticus</i> L.	2	Sp	H	8
<i>Scrophularia umbrosa</i> Dumort.	1	Sp	Hel	7
<i>Sisymbrium officinale</i> (L.) Scop.	1	Arch	T	16
<i>Solanum dulcamara</i> L.	1	Sp	Ch	7
<i>Sonchus arvensis</i> L.	1	Ap	H	16
<i>Sonchus oleraceus</i> L.	1	Arch	T	16
<i>Sparganium erectum</i> L. emend. Rchb. s.s.	1	Sp	Hel	7
<i>Stachys sylvatica</i> L.	1	Sp	H	1
<i>Stellaria graminea</i> L.	1	Ap	H	2
<i>Stellaria holostea</i> L.	1	Sp	H	1
<i>Stellaria media</i> (L.) Vill.	2	Ap	T	16
<i>Stellaria pallida</i> (Dumort.) Piré	1	Ap	T	14
<i>Symphytum officinale</i> L.	1	Sp	H	7
<i>Taraxacum officinale</i> Web.	2	Ap	H	9
<i>Telekia speciosa</i> (Schleb.) Baumg.	1	Sp	H	19
<i>Torilis japonica</i> (Houtt.) DC.	1	Ap	T	3
<i>Trifolium repens</i> L.	2	Ap	H	10
<i>Tussilago farfara</i> L.	1	Ap	G	10
<i>Typha latifolia</i> L.	2	Sp	Hel	7
<i>Urtica dioica</i> L.	2	Ap	H	3
<i>Valeriana officinalis</i> L.	1	Sp	H	8
<i>Verbascum densiflorum</i> Bertol.	1	Ap	T	14
<i>Veronica chamaedrys</i> L. s.s.	2	Ap	H	9
<i>Veronica sublobata</i> M.A. Fisch.	3	Ap	T	3
<i>Vicia angustifolia</i> L.	1	Ap	T	17
<i>Vinca major</i> L.	1	Cul	Ch	1
<i>Vinca minor</i> L.	1	Cul	Ch	1
<i>Viola arvensis</i> Murray	1	Arch	T	17
<i>Viola odorata</i> L.	2	Ken	H	3
<i>Viola papilionacea</i> Pursh	1	Cul	H	19

Frequency classes: 1 – very rare (covering < 5% park area), 2 – rare (5-25%), 3 – moderately frequent (25-50%), 4 – frequent (50-75%), 5 – very frequent (75-100%);

GGH (Geographic-historical status): Ap – apophytes, Arch – archaeophytes, Cul – only in cultivation, Ken – kenophytes, Dia – diaphytes, Sp – spontaneophytes;

GFŽ (Life forms): C – non-woody chamaephytes, Ch – woody chamaephytes, G – geophytes, H – hemicryptophytes, Hel – helophytes, Hyd – hydrophytes, M – megaphanerophytes, N – nanophanerophytes, T – therophytes;

GSE (Socio-ecological groups): 1 – fertile broad-leaved forests and shrub communities (*Fagetalia*, *Prunetalia*), 2 – acidophilous or xerothermic oak forests, mixed coniferous forests and their substitute shrub, herb or grassland communities (*Quercion robori-petraeae*, *Quercion petraeae*, *Epilobion*, *Nardetalia*), 3 – nitrophilous shrub or herb communities (*Sambuco-Salicion*, *Alliarion*), 4 – xerothermic herb or grassland communities (*Trifolio-Geranietea*, *Festuco-Brometea*), 5 – pine forests or sandy grassland (*Dicrano-Pinion*, *Sedo-Scleranthetea*, *Coryneporetea*), 6 – swamp alder forests, woodless fens, bogs and intermediate mires (*Alnion*, *Magnocaricion*, *Caricetalia fuscae*, *Sphagnion fusci*), 7 – riparian forests and thickets, reeds and aquatic vegetation (*Salicion*, *Phragmition*, *Glycerio-Sparganion*, *Potamogetonetea*, *Lemnetea*, *Utricularietea*), 8 – humid meadows and tall herb communities (*Molinietalia*), 9 – fresh and moderately humid meadows (*Arrhenatheretalia*), 10 – nitrophilous floodplains and treaded communities (*Plantaginetea*), 11 – salt marshes and halophilous grasslands (*Thero-Salicornietea*, *Asteretea trifolium*), 12 – therophyte communities on wet and humid sites (*Bidentetea*, *Nanocyperion*), 13 – mesophilous communities of tall perennials (*Arction*), 14 – xerothermic, perennial ruderal communities (*Onopordon*), 15 – temporal, pioneer ruderal communities (*Sisymbriion*, *Eragrostion*), 16 – weed communities of gardens and root crop fields (*Polygono-Chenopodietalia*), 17 – weed communities of cereal fields (*Aperetalia*), 18 – epilithic communities (*Asplenietea*), 19 – species of unknown phytosociological affiliation.



frequent species are not represented by any plant. Among species with the most abundant representation there are seven from the group of moderately frequent species, i.e. *Chelidonium majus*, *Geranium pyrenaicum*, *G. robertianum*, *Petasites hybridus*, *Pinus sylvestris*, *Ranunculus friesianus* and *Veronica sublobata* (Table 2). *Ranunculus friesianus* was probably transported to the park with grass seeds during sod seeding. It is known from other parks in the Wielkopolska region (CZARNA 2007).

TABLE 2. The proportions of species in individual frequency classes in the Miłosław palace park

Frequency class	Number of species	Percentage
Very rare	204	75.55
Rare	59	21.85
Moderately frequent	7	2.59
Frequent	0	0
Very frequent	0	0
Total	270	100

When analysing the proportions of individual vascular plant species of the analysed object in terms of the geographic-historical criterion, it was stated that the most numerous group is composed of native species – apophytes and spontaneophytes, which are jointly represented by 185 species, accounting for 68.51% total flora. The other three groups consist of foreign species. Among them the group represented most numerous comprises kenophytes – 24 species, amounting to almost 10%, while diaphytes and archeophytes are least numerous, being represented by 19 species each, which amounts to over 7% (Table 3). The study included also all species recently introduced to cultivation and not running wild, which are represented by 23 species (8.51%).

TABLE 3. Percentages of geographic-historical status groups in the Miłosław palace park

Geographic-historical status	Number of species	Percentage
Apophytes	113	41.85
Spontaneophytes	72	26.66
Archaeophytes	19	7.03
Kenophytes	24	8.88
Diaphytes	19	7.03
Cultivated	23	8.51
Total	270	100

Species recorded in the analysed park constitute almost the entire spectrum of Raunkiaer's life forms. The most numerous group consists of hemicryptophytes (100 species, 37.03% total flora). Moreover, a considerable proportion was also recorded of therophytes (50 species, 18.51%) and megaphanerophytes (46 species, 17.03%). The least numerous group comprises woody chamaephytes and hydrophytes, which are jointly represented by 14 species, amounting to 5.18% total flora (Table 4). An interesting and relatively large proportion was recorded for geophytes (18 species, 6.66%). Among them over 50% are spring bulbous, rhizomatous or tuberous plants, such as *Adoxa moschatellina*, *Anemone*

*nemorosa*, *Convallaria majalis*, *Corydalis cava*, *Gagea arvensis*, *G. lutea*, *G. pratensis*, *Petasites hybridus* and *Polygonatum multiflorum*.

TABLE 4. Percentages of life forms in the Miłosław palace park

Life form	Number of species	Percentage
Megaphanerophytes	46	17.03
Nanophanerophytes	31	11.48
Non-woody chamaephytes	0	0
Woody chamaephytes	6	2.22
Hemicryptophytes	100	37.03
Geophytes	18	6.66
Helophytes	11	4.07
Hydrophytes	8	2.96
Therophytes	50	18.51
Total	270	100

Vegetation of the analysed object comes from 18 syn-genetic plant community groups (Table 5). The biggest number, i.e. over 40 species (over 15%), prefer communities of fertile broad-leaved forests and shrub communities, as well as those of an unknown phytosociological affiliation, which is connected with the large number of species introduced to cultivation in our times. Species of riparian forests and thickets, reed and aquatic communities rank next (30 species, which accounts for 11.11% total flora), followed by nitrophilous shrub and herb communities (22 species, accounting for 8.14% total flora) as well as acidophilous oak forests, xerothermic oak forests, mixed coniferous forests and substitute clearing, meadow and sward communities (21 species, which amounts to 7.77% total flora).

TABLE 5. Percentages of socio-ecological groups in the Miłosław palace park

Socio-ecological groups	Number of species	Percentage
1	41	15.18
2	21	7.77
3	22	8.14
4	2	0.74
5	6	2.22
6	11	4.07
7	30	11.11
8	10	3.70
9	18	6.66
10	15	5.55
11	1	0.37
12	5	1.85
13	7	2.59
14	19	7.03
15	5	1.85
16	12	4.44
17	3	1.11
18	0	0
19	42	15.55
Total	270	100

Legend as in Table 1.



## CONCLUSION

The paper presents the current composition of vascular flora in the palace park in Miłosław. A total of 270 species of vascular plants were identified, including 43 tree, 44 shrub and 183 herbaceous species.

The study focused on foreign species introduced to cultivation during the original functioning of the palace park, which have survived to the present. These include *Abies concolor*, *Acer negundo* 'Variegatum', *A. pseudo-platanus* 'Purpureum', *A. saccharinum*, *Aesculus hippocastanum*, *Ailanthus altissima*, *Angelica archangelica*, *Anthriscus cerefolium*, *Armoracia rusticana*, *Ballota nigra*, *Bromus carinatus*, *Celtis occidentalis*, *Chamecyparis pisifera* 'Squarosa', *Convallaria majalis*, *Corydalis cava*, *Fagus sylvatica* f. *atropurpurea*, *Gagea arvensis*, *Geranium molle*, *G. pyrenaicum*, *Ginkgo biloba*, *Juglans regia*, *Lamium album*, *Leonurus cardiaca*, *Onopordum acanthium*, *Petasites hybridus*, *Philadelphus coronarius*, *Picea pungens*, *Pinus nigra*, *P. strobus*, *Platanus ×hispanica*, *Polygonatum multiflorum*, *Prunus cerasifera*, *Pseudotsuga menziesii*, *Quercus rubra*, *Ranunculus friesianus*, *Ribes alpinum*, *Robinia pseudoacacia*, *Salix alba* f. *vitaliana pendula*, *Symphoricarpos albus*, *Syringa vulgaris*, *Telekia speciosa*, *Thuja occidentalis* and *Viola odorata*.

In the 1990's numerous ornamental plants were planted, of which few survived to the present. They are *Asarum europaeum*, *Buxus sempervirens*, *Caragana arborescens*, *Eupatorium purpureum*, *Geranium platypetalum*, *Impatiens glandulifera*, *Ligularia dentata*, *Ligustrum vulgare*, *Liliodendron tulipifera*, *Lonicera xylosteum*, *L. mackrii*, *Mahonia aquifolium*, *Parthenocissus inserata* and *Spiraea ×vanhouttei*. At present measures are being taken connected with interplanting of new ornamental plants, mainly around trees and flower beds. They include *Berberis thunbergia*, *Forsythia ×intermedia*, *Galeobdolon luteum*, *Geranium macrorrhizum*, *Hedera helix*, *Juniperus chinensis*, *J. ×pfitzeriana*, *Metasequoia glyptostroboides*, *Nymphaea 'Atropurpurea'*, *Physocarpus opulifolius*, *Vinca major*, *V. minor* and *Viola papilionacea*.

Further observation of introduced plants will contribute to the identification of the most permanent species in the park areas, which may be used for ornamental purposes in parks, gardens or cemeteries.

Two trees-monuments of nature, marked with respective plaques, are growing in the park: a *Ginkgo biloba* with a girth of 337 cm and a *Quercus robur* "Dąb Słowackiego" with a girth of 706 cm, along with several other trees of monumental size (Fig. 1).

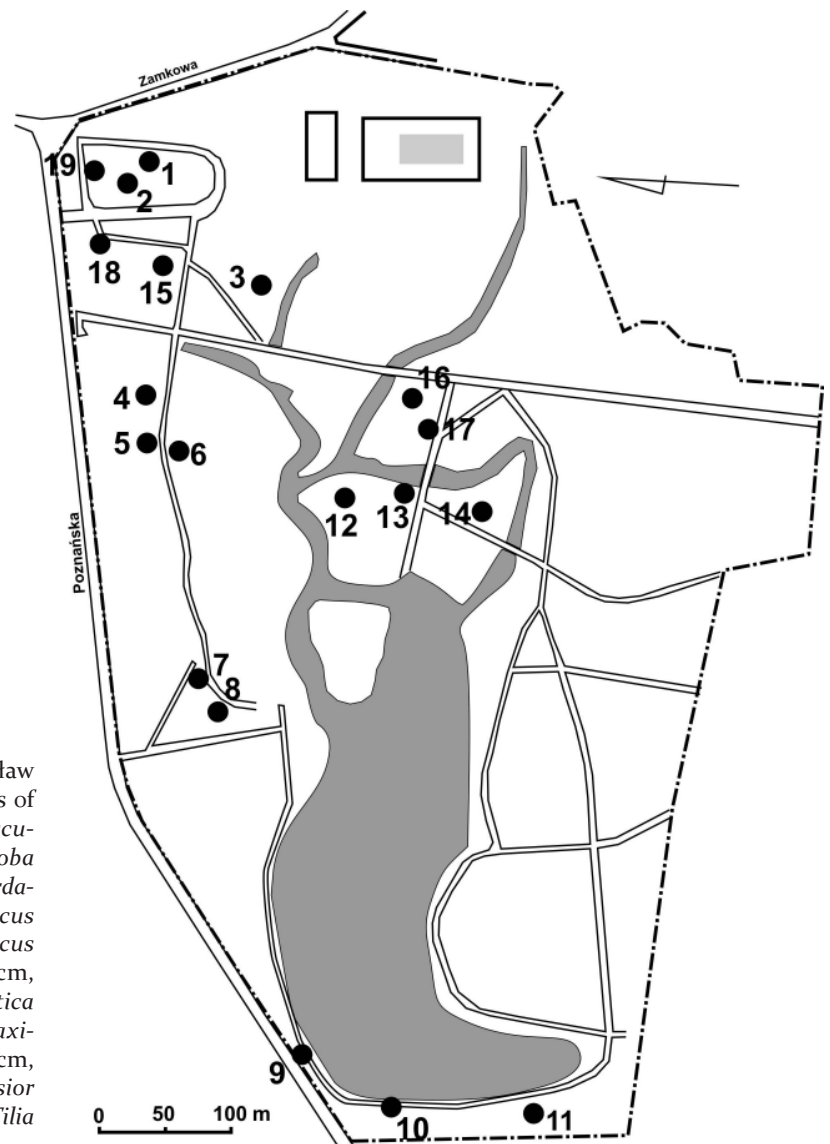


FIG. 1. A plan of the palace park in Miłosław with marked locations of trees-monuments of nature: 1. *Quercus petraea* 355 cm, 2. *Aesculus hippocastanum* 385 cm, 3. *Ginkgo biloba* 337 cm, 4. *Quercus robur* 478 cm, 5. *Tilia cordata* 379 cm, 6. *Tilia cordata* 386 cm, 7. *Quercus robur* 706 cm - "Dąb Słowackiego", 8. *Quercus robur* 477 cm, 9. *Fraxinus excelsior* 455 cm, 10. *Quercus robur* 436 cm, 11. *Fagus sylvatica* 443 cm, 12. *Quercus robur* 384 cm, 13. *Fraxinus excelsior* 356 cm, 14. *Tilia cordata* 452 cm, 15. *Tilia cordata* 310 cm, 16. *Fraxinus excelsior* 310 cm, 17. *Fraxinus excelsior* 363 cm, 18. *Tilia cordata* 400 cm, 19. *Pinus nigra* 255 cm

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