

CURRENT FLORA OF HERBACEOUS PLANTS IN THE CASTLE PARK IN GOŁUCHÓW
(WIELKOPOLSKA REGION, POLAND)

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ABSTRACT. On the basis of floristic studies conducted so far in the castle park in Gołuchów a total of 497 species of herbaceous plants were recorded. The current flora consists of 276 species, among which there are 77 species new for the analysed area. Within approx. 40 years a total of 221 species died out, while 199 survived to the present. When analysing the share of individual socio-ecological groups the biggest difference between the contemporary and historical flora (KRÓL 1965, 1968, 1978) was recorded in group four, i.e. “thermophilous herb communities and xerothermic grassland communities”. In the contemporary flora diaphytes constitute 4.7% and kenophytes 6.2%, while in the historical flora it was 1.7% and 3.6%, respectively (Table 2). Thus we may talk about constant accidental and conscious enrichment of flora in the analysed area with alien species. Among extinct species there were many helophytes and hydrophytes, jointly amounting to approx. 4.5%. Such a situation is at present caused by considerable pollution of waters in the castle park. Species introduced to cultivation before 1978 (KRÓL 1965, 1968, 1978), which have survived to the present, include *Aegopodium podagraria*, *Anemone nemorosa*, *A. ranunculoides*, *Aristolochia clematitis*, *Asarum europaeum*, *Chaerophyllum aromaticum*, *Convallaria majalis*, *Corydalis cava*, *C. intermedia*, *Gagea lutea*, *Hesperis matronalis*, *Lamium maculatum*, *Leonurus cardiaca*, *Luzula luzuloides*, *Myosotis sylvatica*, *Petasites hybridus*, *Poa chaixii*, *Polygonatum multiflorum*, *Ranunculus lanuginosus*, *Reynoutria japonica*, *Rudbeckia laciniata* and *Viola odorata*. Thus it may be stated that most of these species were plants willingly used to decorate parks or cemeteries and that they still may be used in contemporary parks, gardens and cemeteries. They are species exhibiting considerable vigour, the so-called permanent cultivated species. In turn, species introduced to cultivation definitely after 1978 and still recorded at present include *Achillea filipendulina*, *Arum alpinum*, *Campanula latifolia*, *Cephalaria radiata*, *Cicerbita macrophylla*, *Cymbalaria muralis*, *Echinops sphaerocephalus*, *Erigeron ramosus*, *Galanthus nivalis*, *Inula helenium*, *Lupinus polyphyllus*, *Matteucia struthiopteris*, *Ranunculus friesianus* and *Telekia speciosa*. It needs to be observed whether the above mentioned plants exhibit high survival rates and whether they may be used to decorate other parks or cemeteries. The existing tree and shrub nursery contributed to the enrichment of flora in the analysed area with the following species: *Cardamine hirsuta*, *Cerastium glomeratum*, *Oxalis corniculata*, *Sagina procumbens* and *Saxifraga tridactylites*. The above species are being transferred in pots with ornamental plants to new sites such as street flower beds, contemporary cemeteries and home gardens, where they are already quite frequently found. The above mentioned species, except for *Saxifraga tridactylites*, were also recorded in the nursery in a monastery in Lubiń (CZARNA 2004).

KEY WORDS: Wielkopolska, Gołuchów, castle park, vascular flora, ATPOL

INTRODUCTION

Gołuchów, a village established on the Ciemna River (the left tributary of the Prosna River), is located at the Kalisz-Poznań road. It was known already in the 13th century as property of the Toporczyk family, next the Gołuchowski family, from 1507 it belonged to the Leszczyński family, who built a castle there. In the years 1872–85 the castle was rebuilt by Izabella Czartoryska in the French Renaissance style to be used as a museum. Up to 1939 it housed one of the biggest private museums in Europe, with a collection of ancient Greek and Etruscan vases. At present the castle houses the Museum of Castle Furnishings, with a rich collection of art, where exhibition halls are furnished in the style typical of 19th cen-

tury collecting. At present the collection still contains famous vases, plundered during World War II, found in Germany and returned to Gołuchów. In an outbuilding, in the Czartoryski palace there is an exhibition of the Forestry Museum (ANDERS et al. 1995).

The castle is surrounded by a magnificent landscape park, established in the 19th century in the English style. It was founded by Jan and Iza (Izabella) Działyńskis and their gardener, Adam Kubaszewski, an outstanding self-taught landscape architect. The vast expanse of the park and the long time stretch over which it was developed result in it being composed of parts slightly different in style, merging gently. In the vicinity of the castle earlier regular design arrangements may be seen, such as an avenue of hornbeams, long lanes, a little garden on

a terrace, while further the park takes features of landscape naturalism, fashionable at that time, and is gradually transformed into a forest. In places we may observe imitations of the Romantic style from the beginning of the 19th century, i.e. "wild" ravines, intertwined paths, rocky beauty spots, a grotto and water cascades. The Ciemna River flows across the park and its water supply two ponds. In the area of 162 hectares (the length of almost 3 km) we can find over 1500 species and varieties of trees and shrubs (KOŚCIELNY and SĘKOWSKI 1963).

The aim of the study was to determine the current composition of herbaceous vascular flora and herbaceous plants, which were introduced after 1978 and adapted there, and those which survived after being introduced prior to the year 1978 (KRÓL 1965, 1968, 1978).

MATERIAL AND METHODS

Investigations were conducted in the castle park in the vegetation seasons 2001 and 2004 (in the spring and summer), and similarly as in a study by KRÓL (1968), the area of a tree and shrub nursery was also included. The investigations covered also scarce herbaceous cultivated species, which do not spread in the park, but which persist and expand in the original planting site. A list is given of "perennial cultivated plants", which may still constitute good ornamental material for contemporary cemeteries, parks and home gardens. Such a taxon was considered to be a perennial cultivated plant, which was planted in a given site and after the park or its specific part ceased to be used, at present still grows in good condition or even spreads.

The analysed area is located in square ATPOL CD66. The herbarium material was deposited at the herbarium

of the Department of Botany, the Agricultural University of Poznań (POZNB).

The species nomenclature was adopted according to MIREK et AL. (2002). Botanical keys by SZAFER et AL. (1986) and RUTKOWSKI (1998) were used to classify plants.

CONTEMPORARY AND HISTORICAL FLORA AND RESULTS OF STATISTICAL ANALYSIS

The occupied area and lighting, as well as interspecific competition together with the management method adopted for the analysed area, have a considerable effect on the quantitative and qualitative composition of vascular plants. In the castle park in Gołuchów, taking into consideration botanical studies conducted so far, a total of 497 species were recorded (Table 1). The contemporary flora is composed of 276 species, including 77 new species for the analysed area. Within approx. 40 years 221 species died out, while 199 species survived to the present.

When investigating the share of individual species of vascular plants in the analysed object according to the geographic-historical status in the contemporary flora it was found that the most numerous group consists of apophytes, followed by spontaneophytes, accounting jointly for 81.5%. In turn, in the historical flora (KRÓL 1965, 1968, 1978) the most numerous group was composed of spontaneophytes, followed by apophytes, amounting jointly to 85.4%. Archeophytes in both types of flora had a similar share. Considerable differences were observed in the contents of diaphytes and kenophytes. In the contemporary flora diaphytes constitute 4.7%, while kenophytes 6.2%, whereas in the historical flora the figures were 1.7% and 3.6%, respectively (Table 2). Thus, we may talk about permanent accidental and purposeful enrichment of flora in the analysed area with

TABLE 1. A botanical list of herbaceous plants in the Gołuchów castle park

Species	Contemporary flora (2001, 2004)	Król (1965, 1968, 1978)	GGH	GFŻ	GSE
1	2	3	4	5	6
<i>Achillea filipendulina</i> Lam.	+	.	Dia	G	19
<i>Achillea millefolium</i> L.	.	+	Ap	G	9
<i>Achillea pannonica</i> Scheele	+	+	Ap	G	2
<i>Actaea spicata</i> L.	+	+	Sp	H	1
<i>Adoxa moschatellina</i> L.	+	+	Sp	G	1
<i>Aegopodium podagraria</i> L.	+	+	Sp	H	1
<i>Agrimonia eupatoria</i> L.	.	+	Ap	H	4
<i>Agrostis capillaris</i> L.	.	+	Ap	H	5
<i>Agrostis gigantea</i> Roth	.	+	Ap	G	8
<i>Ajuga genevensis</i> L.	.	+	Sp	H	2
<i>Ajuga reptans</i> L.	+	+	Sp	H	1
<i>Alisma plantago-aquatica</i> L.	.	+	Ap	Hel	7
<i>Alliaria petiolata</i> (M. Bieb.) Cavara & Grande	+	+	Ap	T	3
<i>Allium oleraceum</i> L.	.	+	Ap	G	4
<i>Alopecurus aequalis</i> Sobol.	+	.	Ap	H	12
<i>Alopecurus geniculatus</i> L.	.	+	Ap	H	10
<i>Alopecurus pratensis</i> L.	+	+	Ap	H	9
<i>Amaranthus lividus</i> L.	.	+	Ken	T	16

1	2	3	4	5	6
<i>Amaranthus retroflexus</i> L.	+	+	Ken	T	16
<i>Anagallis arvensis</i> L.	.	+	Arch	T	16
<i>Anchusa officinalis</i> L.	+	+	Ap	H	14
<i>Anemone nemorosa</i> L.	+	+	Sp	G	1
<i>Anemone ranunculoides</i> L.	.	+	Sp	G	1
<i>Angelica sylvestris</i> L.	+	.	Sp	H	8
<i>Anthemis arvensis</i> L.	.	+	Arch	T	17
<i>Anthericum ramosum</i> L.	.	+	Sp	H	2
<i>Anthoxanthum odoratum</i> L.	+	+	Ap	H	2
<i>Anthriscus sylvestris</i> (L.) Hoffm.	+	+	Ap	H	3
<i>Anthyllis vulneraria</i> L.	.	+	Ap	H	5
<i>Apera spica-venti</i> (L.) P. Beauv.	+	+	Arch	T	17
<i>Aphanes arvensis</i> L.	.	+	Arch	T	17
<i>Aquilegia vulgaris</i> L.	+	.	Sp	H	1
<i>Arabidopsis thaliana</i> (L.) Heynh.	+	+	Ap	T	17
<i>Arabis glabra</i> (L.) Bernh.	.	+	Ap	T	4
<i>Arctium minus</i> (Hill.) Bernh.	.	+	Ap	T	14
<i>Arenaria serpyllifolia</i> L.	+	+	Ap	T	5
<i>Aristolochia clematitis</i> L.	+	+	Dia	H	19
<i>Armeria maritima</i> (Mill.) Willd. ssp. <i>elongata</i> (Hoffm.) Bonnier	+	+	Ap	H	5
<i>Armoracia rusticana</i> P. Gaertn., B. Mey. & Scherb.	+	+	Arch	H	13
<i>Arrhenatherum elatius</i> (L.) P. Beauv. ex J. Presl & C. Presl	+	+	Ap	H	9
<i>Artemisia absinthium</i> L.	+	.	Ap	H	14
<i>Artemisia vulgaris</i> L.	+	+	Ap	H	13
<i>Arum alpinum</i> Schott & Kotschy	+	.	Sp	G	1
<i>Asarum europaeum</i> L.	+	+	Sp	H	1
<i>Asparagus officinalis</i> L.	.	+	Ken	G	14
<i>Asperugo procumbens</i> L.	.	+	Ap	T	14
<i>Asplenium trichomanes</i> L.	+	.	Ap	H	17
<i>Astragalus glycyphyllos</i> L.	+	+	Ap	H	2
<i>Athyrium filix-femina</i> (L.) Roth.	+	+	Sp	H	1
<i>Avenula pratensis</i> (L.) Dumort.	.	+	Sp	H	4
<i>Avenula pubescens</i> (Huds.) Dumort.	+	+	Ap	H	9
<i>Ballota nigra</i> L.	+	+	Arch	H	14
<i>Batrachium peltatum</i> Schrank	+	.	Sp	Hyd	7
<i>Bellis perennis</i> L.	+	+	Sp	H	9
<i>Berteroa incana</i> (L.) DC.	.	+	Ap	T	14
<i>Betonica officinalis</i> L.	.	+	Sp	H	2
<i>Bidens cernua</i> L.	+	.	Ap	T	12
<i>Bidens frondosa</i> L.	+	.	Ken	T	12
<i>Bidens tripartita</i> L.	+	+	Ap	T	12
<i>Brachypodium pinnatum</i> (L.) P. Beauv.	.	+	Sp	G	4
<i>Brachypodium sylvaticum</i> (Huds.) P. Beauv.	+	+	Sp	H	1
<i>Briza media</i> L.	.	+	Sp	H	9
<i>Bromus benekenii</i> (Lange) Trimen	+	.	Sp	H	1
<i>Bromus carinatus</i> Hook. & Arn.	+	.	Ken	H	10
<i>Bromus hordeaceus</i> L.	+	+	Ap	T	14
<i>Bromus inermis</i> Leyss.	.	+	Ap	G	14
<i>Bromus ramosus</i> Huds.	.	+	Sp	H	2
<i>Bromus sterilis</i> L.	+	+	Arch	T	14
<i>Bromus tectorum</i> L.	.	+	Arch	T	15
<i>Calamagrostis arudinacea</i> (L.) Roth	+	+	Sp	H	2
<i>Calamagrostis epigejos</i> (L.) Roth	+	+	Ap	G	2
<i>Callitriche verna</i> L. emend. Lönnr. s.s.	+	.	Ap	Hyd	7
<i>Calluna vulgaris</i> (L.) Hull	.	+	Sp	Ch	5

1	2	3	4	5	6
<i>Caltha palustris</i> L.	+	+	Sp	H	8
<i>Calystegia sepium</i> (L.) R. Br.	+	+	Sp	G	7
<i>Campanula glomerata</i> L.	.	+	Ap	H	4
<i>Campanula latifolia</i> L.	+	.	Sp	H	1
<i>Campanula patula</i> L.	+	+	Ap	H	9
<i>Campanula persicifolia</i> L.	.	+	Sp	H	2
<i>Campanula rapunculoides</i> L.	.	+	Ap	H	1
<i>Campanula trachelium</i> L.	.	+	Sp	H	1
<i>Capsella bursa-pastoris</i> (L.) Medik.	+	+	Arch	T	16
<i>Cardamine amara</i> L.	+	+	Sp	H	7
<i>Cardamine hirsuta</i> L.	+	.	Ap	T	16
<i>Cardamine pratensis</i> L.	+	+	Sp	H	8
<i>Cardaminopsis arenosa</i> (L.) Hayek	+	.	Sp	H	9
<i>Carduus crispus</i> L.	+	.	Ap	T	13
<i>Carex acutiformis</i> Ehrh.	+	.	Sp	H	6
<i>Carex canescens</i> L.	.	+	Sp	H	6
<i>Carex caryophyllea</i> Latourr.	.	+	Sp	H	4
<i>Carex elata</i> All.	.	+	Sp	H	6
<i>Carex elongata</i> L.	.	+	Sp	H	6
<i>Carex ericetorum</i> Pollich	.	+	Ap	H	2
<i>Carex flacca</i> Schreb.	.	+	Sp	G	8
<i>Carex flava</i> L.	.	+	Sp	H	6
<i>Carex gracilis</i> Curtis	+	+	Sp	H	6
<i>Carex hirta</i> L.	+	+	Ap	G	10
<i>Carex nigra</i> Reichard	+	+	Sp	H	6
<i>Carex ovalis</i> Gooden.	.	+	Ap	H	2
<i>Carex pallescens</i> L.	.	+	Sp	H	2
<i>Carex panicea</i> L.	.	+	Sp	G	8
<i>Carex paniculata</i> L.	+	+	Sp	H	6
<i>Carex pilulifera</i> L.	.	+	Sp	H	2
<i>Carex praecox</i> Schreb.	+	+	Ap	G	5
<i>Carex riparia</i> Curtis	+	+	Sp	H	6
<i>Carex spicata</i> Huds.	+	+	Ap	H	2
<i>Carex sylvatica</i> Huds.	+	+	Sp	H	1
<i>Carex vulpina</i> L.	+	+	Ap	H	8
<i>Centaurea cyanus</i> L.	.	+	Arch	T	17
<i>Centaurea jacea</i> L.	+	+	Ap	H	9
<i>Centaurea scabiosa</i> L.	.	+	Ap	H	4
<i>Centaureum erythraea</i> Rafn	.	+	Ap	T	2
<i>Cephalaria radiata</i> Griseb.	+	.	Dia	H	19
<i>Cerastium arvense</i> L.	+	+	Ap	H	9
<i>Cerastium glomeratum</i> Thull.	+	.	Sp	H	9
<i>Cerastium holosteoides</i> Fr. emend. Hyl.	+	+	Ap	H	9
<i>Cerastium semidecandrum</i> L.	+	+	Ap	T	5
<i>Ceratophyllum demersum</i> L.	+	.	Sp	Hyd	7
<i>Chaerophyllum aromaticum</i> L.	+	.	Sp	H	3
<i>Chaerophyllum temulum</i> L.	+	+	Ap	T	3
<i>Chamaenerion angustifolium</i> (L.) Scop.	+	+	Ap	H	2
<i>Chamomilla suaveolens</i> (Pursh) Rydb.	+	.	Ken	T	10
<i>Chelidonium majus</i> L.	+	+	Ap	H	3
<i>Chenopodium album</i> L.	+	+	Ap	T	16
<i>Chenopodium glaucum</i> L.	.	+	Ap	T	12
<i>Chenopodium hybridum</i> L.	+	+	Arch	T	16
<i>Chrysosplenium alternifolium</i> L.	.	+	Sp	H	1
<i>Cicerbita macrophylla</i> (Willd.) Wallr.	+	.	Dia	H	19
<i>Cichorium intybus</i> L.	.	+	Arch	H	14

1	2	3	4	5	6
<i>Cicuta virosa</i> L.	.	+	Sp	Hel	6
<i>Cirsium arvense</i> (L.) Scop.	+	+	Ap	G	13
<i>Cirsium oleraceum</i> (L.) Scop.	+	+	Sp	H	8
<i>Cirsium palustre</i> (L.) Scop.	.	+	Sp	H	8
<i>Cirsium vulgare</i> (Savi) Ten.	+	+	Ap	T	13
<i>Clinopodium vulgare</i> L.	.	+	Sp	H	2
<i>Convallaria majalis</i> L.	+	+	Sp	G	2
<i>Convolvulus arvensis</i> L.	.	+	Ap	G	14
<i>Conyza canadensis</i> (L.) Conquist	+	+	Ken	T	15
<i>Coronilla varia</i> L.	+	+	Ap	H	4
<i>Corydalis cava</i> (L.) Schw. et K.	+	+	Sp	G	1
<i>Corydalis intermedia</i> (L.) Mérat	+	.	Sp	G	1
<i>Corynephorus canescens</i> (L.) P. Beauv.	.	+	Ap	H	5
<i>Crepis biennis</i> L.	.	+	Ap	T	14
<i>Crepis capillaris</i> (L.) Wallr.	.	+	Sp	T	9
<i>Crepis tectorum</i> L.	.	+	Ap	T	16
<i>Cuscuta epithymum</i> (L.) L.	.	+	Sp	T	9
<i>Cuscuta europaea</i> L.	.	+	Ap	T	3
<i>Cymbalaria muralis</i> P. Gaertn., B. Mey. & Schreb.	+	.	Ken	H	17
<i>Cynoglossum officinale</i> L.	.	+	Ap	H	3
<i>Cynosurus cristatus</i> L.	.	+	Sp	H	9
<i>Dactylis glomerata</i> L.	+	+	Ap	H	9
<i>Dactylis polygama</i> Horv.	+	.	Sp	H	1
<i>Dactylorhiza maculata</i> (L.) Soó	.	+	Sp	G	8
<i>Daucus carota</i> L.	.	+	Ap	T	9
<i>Deschampsia caespitosa</i> (L.) P. Beauv.	+	+	Sp	H	8
<i>Deschampsia flexuosa</i> (L.) Trin.	+	+	Sp	H	5
<i>Dianthus barbatus</i> L.	.	+	Dia	H	19
<i>Dianthus deltoides</i> L.	.	+	Ap	H	2
<i>Digitalis grandiflora</i> Mill.	.	+	Ap	H	2
<i>Digitaria sanguinalis</i> (L.) Scop.	.	+	Arch	T	15
<i>Dryopteris carthusiana</i> (Vill.) H.P. Fuchs	+	+	Sp	H	2
<i>Dryopteris filix-mas</i> (L.) Schott	+	+	Sp	H	2
<i>Echinochloa crus-galli</i> (L.) P. Beauv.	.	+	Arch	T	16
<i>Echinops sphaerocephalus</i> L.	+	.	Dia	H	14
<i>Echium vulgare</i> L.	.	+	Ap	T	14
<i>Eleocharis palustris</i> (L.) Roem. & Schult.	.	+	Sp	Hel	6
<i>Elodea canadensis</i> Michx.	.	+	Ken	Hyd	7
<i>Elymus caninus</i> (L.) L.	.	+	Sp	G	1
<i>Elymus repens</i> (L.) Gould	.	+	Ap	G	10
<i>Epilobium ciliatum</i> Raf.	+	.	Ken	H	12
<i>Epilobium hirsutum</i> L.	+	.	Ap	H	8
<i>Epilobium palustre</i> L.	.	+	Sp	H	6
<i>Epilobium parviflorum</i> Schreb.	.	+	Sp	H	7
<i>Epilobium roseum</i> Schreb.	.	+	Sp	H	7
<i>Equisetum arvense</i> L.	+	+	Ap	G	6
<i>Equisetum fluviatile</i> L.	.	+	Sp	Hel	7
<i>Equisetum palustre</i> L.	+	+	Sp	G	8
<i>Equisetum sylvaticum</i> L.	.	+	Ap	G	1
<i>Erigeron ramosus</i> (Walters) Britton, Sterns & Poggenb.	+	.	Ken	T	13
<i>Erodium cicutarium</i> (L.) L'Hér.	.	+	Ap	T	16
<i>Erophila verna</i> (L.) Chevall.	.	+	Ap	T	5
<i>Erysimum cheiranthoides</i> L.	.	+	Ap	T	16
<i>Eupatorium cannabinum</i> L.	.	+	Sp	H	7
<i>Euphorbia cyparissias</i> L.	+	+	Ap	H	4
<i>Euphorbia helioscopia</i> L.	+	.	Arch	T	16

1	2	3	4	5	6
<i>Euphrasia stricta</i> D. Wolff ex J.F. Lehm.	.	+	Sp	T	8
<i>Fallopia convolvulus</i> (L.) Á. Löve	+	.	Arch	T	16
<i>Fallopia dumetorum</i> (L.) Holub	+	.	Sp	T	2
<i>Festuca altissima</i> All.	.	+	Sp	H	1
<i>Festuca arundinacea</i> Schreb.	.	+	Ap	H	10
<i>Festuca gigantea</i> (L.) Vill.	+	+	Sp	H	1
<i>Festuca heterophylla</i> Lam.	.	+	Sp	H	2
<i>Festuca ovina</i> L.	+	+	Sp	H	2
<i>Festuca pratensis</i> Huds.	+	+	Ap	H	9
<i>Festuca rubra</i> L.	.	+	Ap	H	9
<i>Festuca trachyphylla</i> (Hack.) Krajina	+	.	Ap	H	5
<i>Ficaria verna</i> Huds.	+	+	Sp	G	1
<i>Filago arvensis</i> L.	.	+	Ap	T	5
<i>Filipendula ulmaria</i> (L.) Maxim.	+	+	Sp	H	8
<i>Fragaria moschata</i> Duchesne	.	+	Ap	H	2
<i>Fragaria vesca</i> L.	+	+	Sp	H	2
<i>Fumaria officinalis</i> L.	.	+	Arch	T	16
<i>Gagea lutea</i> (L.) Ker Gawl.	+	+	Sp	G	1
<i>Galanthus nivalis</i> L.	+	.	Dia	G	19
<i>Galeobdolon luteum</i> Huds.	+	+	Sp	H	1
<i>Galeopsis bifida</i> Boenn./ <i>G. tetrahit</i> L.	+	+	Ap	T	2
<i>Galeopsis pubescens</i> Besser	+	.	Ap	T	2
<i>Galinsoga parviflora</i> Cav.	.	+	Ken	T	16
<i>Galium aparine</i> L.	+	+	Ap	T	3
<i>Galium boreale</i> L.	.	+	Sp	G	2
<i>Galium mollugo</i> L.	+	+	Ap	H	9
<i>Galium palustre</i> L.	+	+	Sp	H	6
<i>Galium uliginosum</i> L.	+	.	Sp	H	6
<i>Galium verum</i> L.	.	+	Ap	H	9
<i>Geranium molle</i> L.	+	+	Ken	T	14
<i>Geranium palustre</i> L.	+	+	Sp	H	8
<i>Geranium pratense</i> L.	+	+	Ap	H	9
<i>Geranium pusillum</i> Burm. f. ex L.	+	+	Arch	T	16
<i>Geranium robertianum</i> L.	+	+	Sp	T	3
<i>Geum rivale</i> L.	+	+	Sp	H	8
<i>Geum urbanum</i> L.	+	+	Ap	H	3
<i>Glechoma hederacea</i> L.	+	+	Ap	H	3
<i>Glyceria fluitans</i> (L.) R. Br.	.	+	Ap	Hel	7
<i>Glyceria maxima</i> (Hartm.) Holmb.	+	+	Sp	Hel	7
<i>Gnaphalium sylvaticum</i> L.	.	+	Ap	H	2
<i>Gnaphalium uliginosum</i> L.	.	+	Ap	T	12
<i>Gymnocarpium dryopteris</i> (L.) Newman	.	+	Sp	G	1
<i>Hedera helix</i> L.	+	.	Ap	Ch	1
<i>Heracleum sibiricum</i> L.	+	.	Ap	H	9
<i>Heracleum sphondylium</i> L.	.	+	Ap	H	9
<i>Hesperis matronalis</i> L.	+	+	Dia	H	19
<i>Hieracium lachenalii</i> C.C. Gmel.	+	+	Sp	H	2
<i>Hieracium murorum</i> L. em. Huds.	+	+	Sp	H	2
<i>Hieracium pilosella</i> L.	+	+	Ap	H	5
<i>Hieracium umbellatum</i> L.	.	+	Ap	H	2
<i>Holcus lanatus</i> L.	+	+	Ap	H	8
<i>Holcus mollis</i> L.	.	+	Ap	G	5
<i>Hordeum murinum</i> L.	.	+	Arch	T	15
<i>Humulus lupulus</i> L.	+	+	Sp	H	7
<i>Hyoscyamus niger</i> L.	.	+	Arch	T	14
<i>Hypericum maculatum</i> Crantz	.	+	Sp	H	2

1	2	3	4	5	6
<i>Hypericum perforatum</i> L.	+	+	Ap	H	2
<i>Hypochoeris radicata</i> L.	.	+	Ap	H	5
<i>Impatiens noli-tangere</i> L.	+	+	Sp	T	1
<i>Inula britannica</i> L.	.	+	Ap	H	10
<i>Inula helenium</i> L.	+	.	Dia	H	19
<i>Iris pseudacorus</i> L.	.	+	Sp	Hel	6
<i>Jasione montana</i> L.	.	+	Ap	T	5
<i>Juncus articulatus</i> L. emend. K. Richt.	+	+	Sp	H	8
<i>Juncus bufonius</i> L.	.	+	Ap	T	12
<i>Juncus compressus</i> Jacq.	.	+	Ap	H	10
<i>Juncus effusus</i> L.	+	+	Ap	H	2
<i>Juncus inflexus</i> L.	.	+	Sp	H	8
<i>Juncus tenuis</i> Willd.	+	.	Ken	H	10
<i>Knautia arvensis</i> (L.) J.M. Coult.	.	+	Ap	H	2
<i>Lactuca serriola</i> L.	+	.	Arch	T	15
<i>Lamium album</i> L.	.	+	Arch	H	3
<i>Lamium amplexicaule</i> L.	+	+	Arch	T	16
<i>Lamium maculatum</i> L.	+	+	Sp	H	1
<i>Lamium purpureum</i> L.	+	+	Arch	T	16
<i>Lapsana communis</i> L.	+	+	Ap	T	3
<i>Lathyrus niger</i> (L.) Bernh.	.	+	Sp	G	2
<i>Lathyrus pratensis</i> L.	+	+	Ap	H	9
<i>Lathyrus sylvester</i> L.	.	+	Ap	H	4
<i>Lathyrus vernus</i> (L.) Bernh.	.	+	Sp	G	1
<i>Lemna minor</i> L.	+	+	Ap	Hyd	7
<i>Lemna trisulca</i> L.	.	+	Sp	Hyd	6
<i>Leontodon autumnalis</i> L.	+	.	Ap	H	10
<i>Leonurus cardiaca</i> L.	+	+	Arch	H	14
<i>Lepidium ruderale</i> L.	.	+	Arch	T	15
<i>Leucanthemum vulgare</i> Lam.	+	+	Ap	H	9
<i>Lilium martagon</i> L.	.	+	Sp	G	1
<i>Linaria vulgaris</i> Mill.	.	+	Ap	G	2
<i>Lolium perenne</i> L.	+	+	Ap	H	10
<i>Lotus corniculatus</i> L.	.	+	Ap	H	9
<i>Lotus uliginosus</i> Schkuhr	.	+	Sp	H	6
<i>Lupinus polyphyllus</i> Lindl.	+	.	Ken	H	19
<i>Luzula campestris</i> (L.) DC.	+	+	Sp	H	2
<i>Luzula luzuloides</i> (Lam.) Dandy & Wilmott	+	+	Sp	H	1
<i>Luzula multiflora</i> (Retz.) Lej.	+	+	Sp	H	2
<i>Luzula pilosa</i> (L.) Willd.	.	+	Sp	H	2
<i>Lychnis flos-cuculi</i> L.	+	+	Sp	H	8
<i>Lycopus europaeus</i> L.	+	+	Sp	Hel	7
<i>Lysimachia nummularia</i> L.	+	+	Sp	H	1
<i>Lysimachia punctata</i> L.	.	+	Ken	H	8
<i>Lysimachia vulgaris</i> L.	.	+	Sp	H	7
<i>Lythrum salicaria</i> L.	.	+	Sp	H	7
<i>Maianthemum bifolium</i> (L.) F.W. Schmidt	+	+	Sp	G	2
<i>Malva moschata</i> L.	.	+	Ap	H	4
<i>Malva neglecta</i> Wallr.	+	.	Arch	T	14
<i>Malva sylvestris</i> L.	.	+	Arch	T	14
<i>Matteucia struthiopteris</i> (L.) Tod.	+	.	Dia	H	19
<i>Medicago falcata</i> L.	.	+	Ap	H	4
<i>Medicago lupulina</i> L.	.	+	Ap	H	9
<i>Melampyrum pratense</i> L.	.	+	Sp	T	2
<i>Melandrium album</i> (Mill.) Garcke	+	+	Ap	H	14
<i>Melica nutans</i> L.	+	+	Sp	H	2

1	2	3	4	5	6
<i>Melilotus alba</i> Medik.	.	+	Ap	T	15
<i>Mentha aquatica</i> L.	.	+	Sp	Hel	7
<i>Mentha arvensis</i> L.	.	+	Ap	G	12
<i>Milium effusum</i> L.	+	+	Sp	H	1
<i>Moehringia trinervia</i> (L.) Clairv.	+	+	Sp	H	2
<i>Monotropa hypopitys</i> L.	.	+	Sp	G	2
<i>Mycelis muralis</i> (L.) Dumort.	+	+	Sp	H	1
<i>Myosotis arvensis</i> (L.) Hill.	+	+	Arch	T	17
<i>Myosotis palustris</i> (L.) L. emend. Rchb.	.	+	Sp	H	7
<i>Myosotis ramosissima</i> Rochel	.	+	Sp	T	4
<i>Myosotis sparsiflora</i> Pohl	+	.	Ap	T	3
<i>Myosotis stricta</i> Link ex Roem. & Schult.	+	+	Ap	T	17
<i>Myosotis sylvatica</i> Ehrh. ex Hoffm.	+	+	Sp	T	1
<i>Myosoton aquaticum</i> (L.) Moench	+	+	Ap	H	7
<i>Narcissus poëticus</i> L.	.	+	Dia	G	19
<i>Neottia nidus-avis</i> (L.) Rich.	.	+	Sp	G	1
<i>Nuphar lutea</i> (L.) Sibth. & Sm.	.	+	Sp	Hyd	7
<i>Oenanthe aquatica</i> (L.) Poir.	.	+	Ap	T	12
<i>Oenothera biennis</i> L.	.	+	Ap	T	14
<i>Onobrychis viciifolia</i> Scop.	.	+	Ken	H	4
<i>Ononis arvensis</i> L.	.	+	Sp	H	9
<i>Ononis spinosa</i> L.	.	+	Ap	Ch	9
<i>Onopordon acanthium</i> L.	.	+	Arch	T	14
<i>Origanum vulgare</i> L.	.	+	Ap	H	2
<i>Orthilia secunda</i> (L.) House	.	+	Sp	Ch	5
<i>Oxalis acetosella</i> L.	+	+	Sp	H	2
<i>Oxalis corniculata</i> L.	+	.	Ken	H	16
<i>Oxalis fontana</i> Bunge	+	+	Ken	T	16
<i>Papaver rhoeas</i> L.	.	+	Arch	T	17
<i>Paris quadrifolia</i> L.	.	+	Sp	G	1
<i>Pastinaca sativa</i> L.	+	.	Ap	H	9
<i>Petasites hybridus</i> (L.) P. Gaertn., B. Mey. & Scherb.	+	+	Ap	G	8
<i>Petasites spurius</i> (Rtz.) Rchb.	.	+	Ap	G	8
<i>Petunia × atkinsiana</i> D. Don.	+	.	Dia	T	19
<i>Peucedanum oreoselinum</i> (L.) Moench	.	+	Sp	H	4
<i>Phalaris arundinacea</i> L.	.	+	Ap	H	7
<i>Phleum phleoides</i> (L.) H. Karst.	.	+	Sp	H	4
<i>Phleum pratense</i> L.	.	+	Ap	H	9
<i>Phragmites australis</i> (Cav.) Trin. ex Steud.	+	+	Sp	Hel	7
<i>Pimpinella saxifraga</i> L.	.	+	Ap	H	9
<i>Plantago intermedia</i> Gilib.	+	.	Ap	H	12
<i>Plantago lanceolata</i> L.	+	+	Ap	H	10
<i>Plantago major</i> L.	+	+	Ap	H	10
<i>Plantago media</i> L.	.	+	Ap	H	9
<i>Poa annua</i> L.	+	+	Ap	T	10
<i>Poa chaixii</i> Vill.	+	.	Ken	H	19
<i>Poa compressa</i> L.	+	+	Ap	H	14
<i>Poa nemoralis</i> L.	+	+	Sp	H	2
<i>Poa pratensis</i> L.	.	+	Ap	H	9
<i>Poa trivialis</i> L.	+	+	Ap	H	12
<i>Polygala vulgaris</i> L.	.	+	Sp	H	9
<i>Polygonatum multiflorum</i> (L.) All.	+	+	Sp	G	1
<i>Polygonatum odoratum</i> (Mill.) Druce	+	+	Sp	G	2
<i>Polygonum amphibium</i> L.	.	+	Ap	G	10
<i>Polygonum aviculare</i> L.	+	+	Ap	T	10
<i>Polygonum bistorta</i> L.	.	+	Sp	G	8

1	2	3	4	5	6
<i>Polygonum hydropiper</i> L.	.	+	Ap	T	12
<i>Polygonum lapathifolium</i> L.	.	+	Ap	T	12
<i>Polygonum persicaria</i> L.	+	+	Ap	T	16
<i>Potamogeton crispus</i> L.	+	.	Ap	Hyd	7
<i>Potamogeton lucens</i> L.	.	+	Sp	Hyd	7
<i>Potamogeton natans</i> L.	+	.	Sp	Hyd	7
<i>Potamogeton pectinatus</i> L.	+	.	Sp	Hyd	7
<i>Potamogeton trichoides</i> Cham. & Schldl.	.	+	Sp	Hyd	7
<i>Potentilla alba</i> L.	.	+	Sp	H	2
<i>Potentilla anserina</i> L.	+	+	Sp	H	10
<i>Potentilla arenaria</i> Borkh.	+	+	Sp	H	5
<i>Potentilla argentea</i> L.	.	+	Ap	H	14
<i>Potentilla erecta</i> (L.) Raeusch.	.	+	Sp	H	8
<i>Potentilla heptaphylla</i> L.	.	+	Ap	H	4
<i>Potentilla reptans</i> L.	+	+	Ap	H	10
<i>Primula veris</i> L.	.	+	Sp	H	2
<i>Prunella vulgaris</i> L.	.	+	Sp	H	9
<i>Pteridium aquilinum</i> (L.) Kuhn	+	+	Sp	G	2
<i>Pulmonaria obscura</i> Dumort.	+	+	Sp	H	1
<i>Pulmonaria officinalis</i> L.	.	+	Sp	H	1
<i>Ranunculus acris</i> L.	+	+	Ap	H	9
<i>Ranunculus auricomus</i> L.	+	+	Sp	H	1
<i>Ranunculus bulbosus</i> L.	+	+	Ap	H	4
<i>Ranunculus friesianus</i> Jord.	+	.	Ken	H	19
<i>Ranunculus × intercedens</i> Domin	+	.	Ap	H	19
<i>Ranunculus lanuginosus</i> L.	+	+	Sp	H	1
<i>Ranunculus repens</i> L.	+	.	Ap	H	10
<i>Ranunculus sceleratus</i> L.	+	.	Ap	T	12
<i>Reynoutria japonica</i> Houtt.	+	.	Dia	G	19
<i>Reynoutria sachalinensis</i> (F. Schmidt) Nakai	.	+	Dia	G	19
<i>Rhinanthus serotinus</i> (Schönh.) Oborný	.	+	Sp	T	9
<i>Rorippa amphibia</i> (L.) Besser	+	+	Sp	Hel	7
<i>Rorippa palustris</i> (Leyss.) Bess.	+	+	Ap	T	12
<i>Rubus saxatilis</i> L.	.	+	Sp	H	2
<i>Rudbeckia laciniata</i> L.	+	+	Dia	G	19
<i>Rumex acetosa</i> L.	+	+	Ap	H	9
<i>Rumex acetosella</i> L.	+	+	Ap	G	5
<i>Rumex aquaticus</i> L.	.	7 + L.	Sp	H	7
<i>Rumex crispus</i> L.	+	+	Ap	H	10
<i>Rumex hydrolapathum</i> Huds.	+	+	Sp	Hel	7
<i>Rumex maritimus</i> L.	+	.	Ap	T	12
<i>Rumex obt</i>					

1	2	3	4	5	6
<i>Scrophularia umbrosa</i> Dumort.	+	+	Sp	Hel	7
<i>Scutellaria galericulata</i> L.	.	+	Sp	Hel	6
<i>Sedum acre</i> L.	.	+	Ap	H	5
<i>Sedum maximum</i> (L.) Hoffm.	+	+	Sp	G	2
<i>Sedum sexangulare</i> L.	+	.	Sp	H	5
<i>Senecio jacobaea</i> L.	.	+	Ap	H	4
<i>Senecio vernalis</i> Waldst. & Kit.	+	+	Ken	T	15
<i>Senecio vulgaris</i> L.	+	+	Arch	T	16
<i>Serratula tinctoria</i> L.	.	+	Sp	H	8
<i>Setaria verticillata</i> (L.) P. Beauv.	.	+	Arch	T	16
<i>Setaria viridis</i> (L.) P. Beauv.	.	+	Arch	T	16
<i>Sisymbrium officinale</i> (L.) Scop.	+	+	Arch	T	16
<i>Sium latifolium</i> L.	.	+	Sp	Hel	7
<i>Solanum dulcamara</i> L.	+	+	Sp	Ch	7
<i>Solanum nigrum</i> L. emend. Mill.	+	+	Arch	T	16
<i>Solidago canadensis</i> L.	.	+	Ken	G	13
<i>Solidago virgaurea</i> L.	+	+	Sp	H	2
<i>Sonchus arvensis</i> L.	+	.	Ap	G	16
<i>Sonchus oleraceus</i> L.	+	+	Arch	T	16
<i>Sonchus palustris</i> L.	.	+	Sp	H	11
<i>Sparganium erectum</i> L. emend. Rchb.	.	+	Sp	Hel	7
<i>Spergularia rubra</i> (L.) J. Presl & C. Presl	.	+	Ap	T	5
<i>Spirodela polyrhiza</i> (L.) Schleid.	.	+	Ap	Hyd	7
<i>Stachys lanata</i> Jacq.	.	+	Dia	H	19
<i>Stachys palustris</i> L.	+	+	Sp	G	7
<i>Stachys sylvatica</i> L.	+	+	Sp	H	1
<i>Stellaria holostea</i> L.	+	+	Sp	H	1
<i>Stellaria media</i> (L.) Vill.	+	+	Ap	T	16
<i>Stellaria pallida</i> (Dumort.) Piré	+	.	Ap	T	16
<i>Stellaria palustris</i> Retz.	+	+	Sp	H	8
<i>Symphytum officinale</i> L.	.	+	Sp	H	7
<i>Taraxacum officinale</i> Web.	+	+	Ap	H	9
<i>Taraxacum palustre</i> (Lyons) Lam. et DC.	.	+	Sp	H	8
<i>Telekia speciosa</i> (Schreb.) Baumg.	+	.	Sp	H	19
<i>Thalictrum aquilegifolium</i> L.	.	+	Sp	H	1
<i>Thalictrum minus</i> L.	+	+	Sp	H	4
<i>Thlaspi arvense</i> L.	+	+	Arch	T	16
<i>Thymus pulegiodes</i> L.	.	+	Sp	Ch	4
<i>Thymus serpyllum</i> L. em. Fr.	+	+	Ap	Ch	5
<i>Trientalis europaea</i> L.	.	+	Sp	G	2
<i>Trifolium alpestre</i> L.	.	+	Ap	H	4
<i>Trifolium arvense</i> L.	.	+	Ap	T	5
<i>Trifolium aureum</i> Pollich	.	+	Ap	T	19
<i>Trifolium campestre</i> Schreb.	.	+	Ap	T	9
<i>Trifolium dubium</i> Sibth.	+	+	Ap	T	9
<i>Trifolium pratense</i> L.	+	+	Ap	H	9
<i>Trifolium repens</i> L.	+	+	Ap	H	10
<i>Trisetum flavescens</i> (L.) P. Beauv.	+	+	Sp	H	9
<i>Tussilago farfara</i> L.	+	+	Ap	G	10
<i>Typha angustifolia</i> L.	.	+	Sp	Hel	7
<i>Typha latifolia</i> L.	.	+	Sp	Hel	7
<i>Urtica dioica</i> L.	+	+	Ap	H	3
<i>Urtica urens</i> L.	.	+	Arch	T	16
<i>Vaccinium myrtillus</i> L.	+	+	Sp	Ch	5
<i>Vaccinium vitis-idaea</i> L.	+	+	Sp	Ch	5
<i>Valeriana officinalis</i> L.	.	+	Sp	H	8

1	2	3	4	5	6
<i>Verbascum densiflorum</i> Bertol.	.	+	Ap	T	14
<i>Verbascum lychnitis</i> L.	.	+	Ap	T	5
<i>Verbascum phlomoides</i> L.	+	.	Ap	T	14
<i>Veronica anagallis-aquatica</i> L.	.	+	Ap	H	12
<i>Veronica arvensis</i> L.	+	.	Ap	T	17
<i>Veronica beccabunga</i> L.	.	+	Sp	H	7
<i>Veronica catenata</i> Pennell	+	.	Ap	H	12
<i>Veronica chamaedrys</i> L.	+	+	Ap	H	9
<i>Veronica hederifolia</i> L. s.s.	+	.	Ap	T	16
<i>Veronica officinalis</i> L.	+	+	Ap	H	2
<i>Veronica opaca</i> Fr.	.	+	Arch	T	16
<i>Veronica polita</i> Fr.	+	.	Arch	T	16
<i>Veronica scutellata</i> L.	.	+	Sp	H	6
<i>Veronica serpyllifolia</i> L.	+	+	Ap	H	10
<i>Veronica sublobata</i> M.A. Fisch.	+	+	Ap	T	3
<i>Vicia angustifolia</i> L.	+	+	Ap	T	17
<i>Vicia cracca</i> L.	+	+	Ap	G	8
<i>Vicia dumetorum</i> L.	.	+	Ap	H	3
<i>Vicia hirsuta</i> (L.) Gray.	+	+	Arch	T	17
<i>Vicia lathyroides</i> L.	.	+	Sp	T	5
<i>Vicia sepium</i> L.	+	+	Sp	G	1
<i>Vicia tetrasperma</i> (L.) Schreb.	.	+	Arch	T	17
<i>Vinca minor</i> L.	+	.	Dia	Ch	19
<i>Viola arvensis</i> Murr.	.	+	Arch	T	17
<i>Viola canina</i> L.	.	+	Ap	H	2
<i>Viola mirabilis</i> L.	.	+	Sp	H	1
<i>Viola odorata</i> L.	+	+	Ken	H	3
<i>Viola reichenbachiana</i> Jord. ex Boreau	+	+	Sp	H	1
<i>Viola riviniana</i> Rchb.	+	.	Sp	H	2
<i>Viscaria vulgaris</i> Röhl.	+	+	Ap	H	2
<i>Viscum album</i> L. ssp. <i>austriacum</i> (Wiesb.) Vollm.	+	+	Sp	Ch	5

GGH (geographic-historical status): Ap – apophyte, Arch – archaeophyte, Dia – diaphyte, Ken – kenophyte, Sp – spontaneophyte, Up – only in cultivation;

GFŻ (life forms): C – non-woody chamaephyte, Ch – woody chamaephyte, G – **geophyte**, H – **hemicryptophyte**, Hel – **helophyte**, Hyd – hydrophyte, M – megaphanerophyte, N – nanophanerophyte, T – therophyte;

GSE (socioecological 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 roboretanae*, *Q. 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*, *Corynephoretea*), 6 – swamp alder forests, woodless fens, bogs and intermediate mires (*Alnion*, *Magnocaricion*, *Caricetalia fuscae*, *Sphagnion fuscii*), 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 – short-term 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.

alien species. Among extinct species the most numerous group was composed of apophytes and spontaneophytes, both with approx. 20%, with both these groups being the most numerous ones at present, although accounting for only approx. 10% each. Among alien species the biggest number of extinct species was found among archeophytes – approx. 5%, followed by kenophytes with 1.7% and diaphytes with 0.95%, respectively, while at present the biggest number of new species belonged to kenophytes (4%), followed by diaphytes (3.6%) and archeophytes (1.8%). In the constantly used Gołuchów park changes were observed in the species composition

of alien plants, which turn out to be as could be expected – the number of the oldest species, i.e. archeophytes, is decreasing, while the youngest species, i.e. diaphytes and kenophytes, are increasing in number.

Species in the analysed area represent the entire spectrum of life forms as classified by Raunkiaer (Table 3). **Both currently and historically** (KRÓL 1965, 1968, 1978), the most numerous group is composed of hemicryptophytes, amounting to approx. 50% each. A relatively large difference in the contemporary and historical studies was found for helophytes. At present they account for 2.2%, while historically they constituted 4.3%.

TABLE 2. Contributions of geographic-historical groups to the flora of the Gołuchów castle park

(GGH) Geographic- historical group	Current studies (2001, 2004)		KRÓL (1965, 1968, 1978)	
	the number of species	%	the number of species	%
Apophytes	116	42.0	174	41.4
Spontaneophytes	109	39.5	185	44.0
Archaeophytes	21	7.6	39	9.3
Kenophytes	17	6.2	15	3.6
Diaphytes	13	4.7	7	1.7
Total	276	100	420	100

TABLE 3. Contributions of Raunkiaer's life forms to the flora of the Gołuchów castle park

(GFŻ) Life form	Contemporary flora (2001, 2004)		KRÓL (1965, 1968, 1978)	
	the number of species	%	the number of species	%
Hel – helophytes	6	2.2	18	4.3
Hyd – hydrophytes	6	2.2	8	1.9
Ch – woody chamephytes	7	2.5	10	2.4
H – hemicrypto- phytes	163	59.0	223	53.3
G – geophytes	32	11.6	60	14.3
T – therophytes	62	22.5	100	23.8
Total	276	100	420	100

Such a condition is currently caused by considerable pollution of waters in the castle park. Also in historical studies slightly bigger numbers of geophytes were recorded than it was the case in contemporary studies. Among extinct species the biggest numbers of species belonged to hemicryptophytes (approx. 25%), also these life forms were most numerous within these species which appeared at present – approx. 14%. Among extinct species also helophytes and hydrophytes constitute a large group, jointly amounting to approx. 4.5%, while at present jointly only approx. 2% belonged to these two groups. Among extinct species geophytes constituted approx. 8%, while only approx. 2% appeared in the present times. Much bigger numbers of therophytes – approx. 14% – died out and only 8% appeared in contemporary times.

When analysing the share of individual socio-ecological groups the biggest difference between the contemporary and historical flora (KRÓL 1965, 1968, 1978) was recorded in group four, i.e. xerothermic herb or grassland communities (Table 4). The historical flora accounted to as much as 6.2%, while at present it is only 1.8%. Relatively big differences were also recorded in group 1, i.e. species found in fertile broad-leaved forests and shrub communities, and group 2 – in acidophilous or xerothermic oak forests, mixed coniferous forests and their substitute shrub, herb and grassland communities.

TABLE 4. The share of socio-ecological groups in the Gołuchów castle park

(GSE) Socio-ecological group	Contemporary flora (2001, 2004)		KRÓL (1965, 1968, 1978)	
	the number of species	%	the number of species	%
1	40	14.5	46	11.0
2	29	10.5	61	14.5
3	14	5.1	15	3.6
4	5	1.8	26	6.2
5	16	5.8	19	6.9
6	8	2.9	18	4.3
7	20	7.2	38	9.0
8	18	6.5	30	7.1
9	25	9.1	42	10.0
10	19	6.9	19	4.5
11	0	0	0	0
12	11	4.0	13	3.1
13	7	2.5	5	1.2
14	13	4.7	24	5.7
15	3	1.1	7	1.7
16	22	8.0	27	6.4
17	9	3.3	12	2.9
18	0	0	0	0
19	17	6.2	8	1.9
Total	276	100	420	100

For contemporary flora these figures are 14.5 and 10.5%, respectively, while for historical flora they were 11.0 and 14.5%. Among extinct species group 2 was the most numerous, accounting for 7.9%. Groups 4 and 7 appeared next, amounting to approx. 5% each, and groups 5 and 1 with approx. 4% each. In turn, group 19, composed of species with unknown phytosociological affiliation, is found among species appearing in biggest numbers, at approx. 5%. It is followed by groups 1, 16, 12, 7 and 14, whereas the other groups have approx. 1% each.

DISCUSSION

Among species introduced to cultivation before the year 1978 (KRÓL 1978), the following have survived to the present: *Aegopodium podagraria*, *Anemone nemorosa*, *A. ranunculoides*, *Aristolochia clematitis*, *Asarum europaeum*, *Chaerophyllum aromaticum*, *Convallaria majalis*, *Corydalis cava*, *C. intermedia*, *Gagea lutea*, *Hesperis matronalis*, *Lamium maculatum*, *Leonurus cardiaca*, *Luzula luzuloides*, *Myosotis sylvatica*, *Petasites hybridus*, *Poa chaixii*, *Polygonatum multiflorum*, *Ranunculus lanunigosus*, *Reynoutria japonica*, *Rudbeckia laciniata* and *Viola odorata*. Thus it may be stated that most of these species were plants willingly used to decorate parks or cemeteries; what is more, they may still be used in contemporary parks, gardens and cemeteries. They are species exhibiting considerable vigour, treated as perennial cultivated species. Plants introduced to be cultivated, which did not survive to the present, include *Dianthus barbatus*, *Lilium martagon*, *Lysimachia punctata*, *Malva moschata*, *Narcissus poeticus*, *Onopordon acanthium*, *Solidago canadensis*

and *Stachys lanata*. In turn, species introduced to cultivation certainly after 1978 and still found today include *Achillea filipendulina*, *Arum alpinum*, *Campanula latifolia*, *Cephalaria radiata*, *Cicerbita macrophylla*, *Cymbalaria muralis*, *Echinops sphaerocephalus*, *Erigeron ramosus*, *Galanthus nivalis*, *Inula helenium*, *Lupinus polyphyllus*, *Matteucia struthiopteris*, *Ranunculus friesianus*, *Sambucus ebulus* and *Telekia speciosa*. Here *Cicerbita macrophylla* has its second known site in the Wielkopolska region (CZARNA 2003). This species does not set fruits, but grows well in the vegetative state, especially in open positions. As far as herbaceous plants coming from nature are concerned, definitely the following are found in the park: *Anemone nemorosa*, *A. ranunculoides*, *Asarum europaeum*, *Campanula latifolia*, *Chaerophyllum aromaticum*, *Convallaria majalis*, *Corydalis cava*, *C. intermedia*, *Gagea lutea*, *Luzula luzuloides*, *Lamium maculatum*, *Petasites hybridus*, *Poa chaixii*, *Polygonatum multiflorum* and *Ranunculus lanuginosus*. In relation with this fact, castle, palace and former manor parks are also refuges for native flora, which was already shown on the basis of the presence of *Leucoium vernum* in the palace park in Turew (CZARNA 2001).

Species which definitely were not present in the castle park in Gołuchów and which were incorrectly classified (KRÓL 1965, 1968) include *Sonchus palustris*, which could have been mistaken with *Sonchus arvensis*, *Bromus ramosus* with *B. benekenii*, *Rumex aquaticus* with *R. obtusifolius*, *Reynoutria sachalinensis* with *R. japonica*, while *Festuca altissima* with *Poa chaixii*, whereas *Petasites spurius* is associated with larger river valleys.

The existing tree and shrub nursery contributed to the enrichment of flora in the analysed area with *Oxalis corniculata*, *Cardamine hirsuta*, *Sagina procumbens*, *Saxifraga tridactylites*, and *Cerastium glomeratum*. The above mentioned species in pots with ornamental plants are transferred to new locations: street flower beds, contemporary cemeteries, home gardens – where they are already found relatively often. These species, except for *Saxifraga tridactylites*, were also recorded in the nursery of a monastery in Lubiń (CZARNA 2004).

CONCLUSIONS

The contemporary flora of the Gołuchów castle park is composed of 276 species, among which 77 are new species for the analysed area.

When analysing the shares of individual socio-ecological groups, the biggest difference was reported between contemporary and historical flora (KRÓL 1965, 1968, 1978) in group four, i.e. thermophilous herb communities and xerothermic grassland communities. Such a situation may have been caused by the recent utilization of a considerable percentage of swards to grow ornamental shrubs and trees.

In the permanently used Gołuchów Park changes were observed in the species composition of alien plant species, which are as need to be expected – the oldest species, i.e. archeophytes, are decreasing in number, while the youngest species, i.e. diaphytes and kenophytes are becoming more numerous. In the contemporary flora diaphytes constitute 4.7%, while kenophytes

6.2%, whereas in the historical flora the figures were 1.7% and 3.6%, respectively (Table 2). Thus we may talk of constant accidental and conscious enrichment of flora in the analysed area with alien species.

Among extinct species there were many helophytes and hydrophytes, jointly approx. 4.5%. This situation is at present caused by considerable pollution of waters in the castle park.

In the park vascular flora we need to focus on species introduced to cultivation after the year 1978. They include *Achillea filipendulina*, *Arum alpinum*, *Campanula latifolia*, *Cephalaria radiata*, *Cicerbita macrophylla*, *Cymbalaria muralis*, *Echinops sphaerocephalus*, *Erigeron ramosus*, *Galanthus nivalis*, *Inula helenium*, *Lupinus polyphyllus*, *Matteucia struthiopteris*, *Ranunculus friesianus*, *Sambucus ebulus* and *Telekia speciosa*. It needs to be observed whether the above mentioned plants exhibit high vigour and whether they may be used to decorate other parks or cemeteries.

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