

## A Collection of the Dendrological Garden in Glinna (Northwest Poland)

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### Abstract

The small dendrological garden in Glinna (about 6 ha) near Szczecin (northwest Poland) is one of the 16 scientific places in Poland, which is well-known for growing a lot of unique trees. The local mild microclimate in combination with the Atlantic climate of West Pomerania produce favourable conditions for growing many varieties of trees and shrubs which undergo freezing in central and eastern Poland. The garden's collection amounts up to 632 taxons of trees and shrubs, representatives of 199 genera. What is valuable in the collection of the arboretum is that the cultural varieties among the gymnospermous plants make only 25%, whereas among the angiospermous plants – 10%. The mammoth tree remains the garden's symbol and its speciality consists in species of Chinese origin (180 taxons) and maples (68 taxons).

**Keywords:** dendrological garden, arboretum, collection, Glinna, Poland

### Introduction

The dendrological garden in Glinna near Szczecin (northwest Poland, 53°17'N, 14°43'E) is one of the 16 scientific places in Poland well known for growing a lot of unique trees. This quite small because only a 6 hectare large garden is situated 15 km from Szczecin (the capital of West Pomerania, the seventh largest city in respect of the population – 413 thousand and the third largest in respect of the area in Poland – 301 km<sup>2</sup>) and 140 kilometres from Berlin (Figure 1). The arboretum serves for scientific, educational, leisure and aesthetic purposes. Its importance is particular because of lack of a botanical garden in Szczecin necessary for educating pupils and students of many walks of natural sciences. The specific, mild weather conditions



Figure 1 The location of Glinna

and the garden's microclimate allow the growth of a lot of valuable trees and shrubs that originate from different parts of the Earth planet and would not grow in other parts of Poland.

The aim of this work is to show a collection of trees from the dendrological garden in Glinna and to present the results of their growing in the climatic conditions of northwest Poland.

### Materials and methods

The Garden is to be found in the southeast part of the Beechwood Forest in the so – called Sunshine Basin. The surrounding moraine hills covered with dense and tall beech trees screen the area from the northern and eastern winds. The location is 51 – 68 meters above the sea level and slightly steeps westwards. Its northern and western parts are cut through by a small periodical stream of Gliniec. The unique local microclimate in combination with the Atlantic climate of West Pomerania produce favourable conditions for growing many varieties of trees and bushes which go freeze in the central and eastern Poland. According to the Heinze and Schreiber's, (1984) resistance zone of trees to frost the garden is situated in the subzone 7a with the many years minimum average temperature from -15,0°C to -17,7°C. The bioindicators of this subzone are: *Cedrus libanii* subsp. *atlantica*, *Ilex aquifolium* and *Prunus laurocerasus* which grow well in Glinna and do not freeze. The average yearly temperature is 8,5°C, -1,0°C in January, 18,5°C in July and the average rainfall – 524 mm (349-715

mm). The local brown soil of the beech tree forest type has a beneficial influence on the acclimatization of the plants.

The history of the garden goes back as far as 1823 when private tree and shrub nurseries were founded here to be taken over by Śmierdnica Forest District Administration in 1870. Most of the oldest and rare species of exotic trees date back to that period. They were then planted on the nursery's peripheral grounds to establish their resistance to cold or to propagate them. Achievements of that period are associated with Carl Ludwig Gené, Chief of Śmierdnica Forest District by the end of the 19<sup>th</sup> century. The first mention of the Garden dates back to 1911, and the Inventory of 1938 lists 51 exotic trees and shrubs. Colds, hurricane winds, the prolific growth of native vegetation and no planting in the post-war period left only 23 species

of the initial inventory list, as of 1970 (Tumiłowicz 1994, 1996).

In 1970, State Forest Administration and Arboretum SGGW in Rogów started a close co-operation to manage the establishment appropriately. Since then the garden has been looked after by professor Jerzy Tumiłowicz, who keeps enriching the garden's collection and keeps a perfect record of all the trees. It was agreed that the two – hectare area of the garden makes it impossible to cultivate such a rich and comprehensive collection of trees and shrubs for which dendrological gardens of universal type in Kórnik, Rogów or Przelewice are famous. A target of 250 – 300 species was set with the possibility of doubling the number as the area of the Arboretum expands. It was also agreed that special attention should be paid to the species of trees

Tabel 1 The list of selected trees and shrubs

No	The Latin name of trees, shrubs	No	The Latin name of trees, shrubs
1	2	3	4
The oldest trees in the garden		Angiospermae	
1	<i>Abies cephalonica</i> Loudon *	32	<i>Abelia mosanensis</i> Nakai
2	<i>Abies grandis</i> (Douglas ex D.Don) Lindl. *	33	<i>Acer griseum</i> (Franch.) Pax
3	<i>Abies procera</i> Rehder	34	<i>Acer palmatum</i> Thunb. ex Murray
4	<i>Carya ovata</i> (Mill.) K.Koch *	35	<i>Acer pensylvanicum</i> L.
5	<i>Chamaecyparis pisifera</i> (Siebold et Zucc.) Endl.	36	<i>Acer saccharum</i> Marshall
6	<i>Chamaecyparis thuyoides</i> B.S.P. *	37	<i>Aralia elata</i> (Miq.) Seem.
7	<i>Fagus sylvatica</i> L. 'Miltonensis' *	38	<i>Asimina triloba</i> (L.) Dun.
8	<i>Juniperus virginiana</i> L.	39	<i>Calycanthus fertilis</i> Walt
9	<i>Platanus × hispanica</i> Mill ex Münchh. 'Acerifolia'	40	<i>Castanea sativa</i> Mill.
10	<i>Taxodium distichum</i> (L.) Rich.	41	<i>Cercidiphyllum japonicum</i> Siebold et Zucc.
11	<i>Thuja plicata</i> Donn ex D.Don	42	<i>Cercis siliquastrum</i> L.
12	<i>Tsuga canadensis</i> (L.) Carrière	43	<i>Chimonanthus praecox</i> (L.) Link
Gymnospermae		44	<i>Clerodendron trichotomum</i> Thunb.
13	<i>Abies pinsapo</i> Boiss.	45	<i>Cornus nuttallii</i> Audub.
14	<i>Calocedrus decurrens</i> (Torr.) Florin	46	<i>Davidia involucrata</i> var. <i>vilmoriniana</i> (Dode) Wagner
15	<i>Cedrus libani</i> A.Rich.	47	<i>Decaisnea fargesii</i> Franch.
16	<i>Cedrus libani</i> subsp. <i>atlantica</i> (Endl.) Batt. et Trab.	48	<i>Hamamelis mollis</i> Oliv.
17	<i>Cephalotaxus harringtonia</i> (Knight ex J.Forbes)	49	<i>Ilex aquifolium</i> L.
18	<i>Chamaecyparis obtusa</i> (Siebold et Zucc.) Endl.	50	<i>Kalopanax septemlobus</i> (Thunb. ex A.Murray) Koidz.
19	<i>Cryptomeria japonica</i> (Thunb. ex L.f.) D.Don	51	<i>Liquidambar styraciflua</i> L.
20	<i>Cunninghamia lanceolata</i> (Lamb.) Hook.	52	<i>Liriodendron chinense</i> Sarg.
21	<i>Cupressus bakeri</i> Jeps.	53	<i>Magnolia officinalis</i> var. <i>biloba</i> Rehder et Wils.
22	<i>Ginkgo biloba</i> L.	54	<i>Magnolia sieboldii</i> K.Koch
23	<i>Metasequoia glyptostroboides</i> Hu et. W.C. Cheng	55	<i>Magnolia tripetala</i> (L.) L.
24	<i>Pinus aristata</i> Engelm.	56	<i>Paulownia tomentosa</i> (Thunb. ex Murr.) Steudel
25	<i>Pinus coulteri</i> D.Don	57	<i>Prunus laurocerasus</i> L.
26	<i>Pinus flexilis</i> James	58	<i>Sassafras albidum</i> Nees
27	<i>Pinus koraiensis</i> Siebold et Zucc.	59	<i>Sinocalycanthus chinensis</i> (Cheng et S.Y.Chang) Cheng et S.Y.Chang
28	<i>Pseudolarix kaempferi</i> (Lindl.) Gord.	60	<i>Skimmia japonica</i> Thunb.
29	<i>Sciadopitys verticillata</i> (Thunb.) Siebold. et Zucc.	61	<i>Stewartia serrata</i> Max
30	<i>Sequoiadendron giganteum</i> (Lindl.) J.Buchholz	62	<i>Viburnum alnifolia</i> Marsh.
31	<i>Torreya californica</i> Torr.	63	<i>Viburnum dilatatum</i> Thunb.

\* the biggest trees in Poland

and shrubs which freeze in other parts of Poland and to those whose cold resistance was unknown. Rare and new for us species of trees and shrubs are planted in the garden to test their growth, vitality and resistance to frost. Having arranged areas 5 and 6 and 2 and 7 partially, the self-disseminated trees and shrubs of the remaining quarters were removed. In particular, species of strong native trees and bushes were left to grow permanently, along with the protected ones (daphne, honeysuckle and yew). In 1985, the garden was expanded by 1.8 ha taking the land from the adjacent farmland. Alongside the Arboretum, a Forest Information Post with an Educational Path was started in 1997, where manifold educational activities are conducted.

In the year 2005 on the 125<sup>th</sup> anniversary of the foundation of the garden a decision was made to enlarge the area by 6 hectares. In order to make the management of the garden collection more efficient and to render the scientific – educational information accessible, work was undertaken in the same year to create digital maps (Kubus, Łysko 2006). Their basic task is to gather spatial information together with other non-spatial data (e.g. the origin of a plant) the year of planting, morphological and bio-

metrical data, the state of health etc.). In this way a GIS system (Geographic Information System) came into being – a way of organizing data which enables its storage, processing and analysis. A thematic digital map published on the internet ensures access to the information to a wider group of interested people. The data can be updated “on-line” without the need of turning off the server.

### Results and discussion

The garden's collection amounts up to 632 taxons of trees and shrubs, representatives of 199 genera. It is proper to add that cultivars varieties among the gymnosperms plants include only 25% of the whole collection whereas among the angiosperms ones – 10% (Tumiłowicz 2006). Table 1 presents a list of selected and most valuable taxons whereas figure 2 shows their localization. What is valuable in the collection of the arboretum is that the cultural varieties among the gymnospermous plants make only 25%, whereas among the angiospermous plants – 10% (Tumiłowicz 2006).

The dendrological garden of Glinna is widely known for a number of species of Poland's biggest exotic trees



Figure 2 The garden's plan together with the localization of selected trees and shrubs

growing here. These are: *Abies cephalonica* (367 cm in the trunk's circumference/24 meters in height), *Abies grandis* (442 cm/42 m h), *Chamaecyparis thyoides* (118 cm/15 m h), *Carya ovata* (286 cm/32 m h), *Fagus sylvatica* 'Miltonensis' (328 cm/30 mh) – fig. 2. Until quite lately the biggest specimen of mammoth tree *Sequoiadendron giganteum* in Poland (its trunk's circumference – 446 cm) grew here, however, it froze during „the winter of the century” in 1987, when the absolute minimum temperature dropped to -30°C. The mammoth tree (there are 7 trees of this species, the biggest specimen 157 cm in the trunk's circumference, the highest – 15 meters in height) remains as the garden's symbol and its speciality are species of Chinese origin (180 taxons) and maples (68 taxons). Table 1 presents a list whereas figure 2 localization of chosen taxons.

About 25 species introduced for the first time to Poland, are growing in the garden (Tumiłowicz 2002). Among gymnospermous plants that are seldom grown in Poland apart from those presented in table 1, there are: *A. spectabilis*, *Larix laricina*, *Picea smithiana*, *Pinus tabulaeformis*, *P. densiflora*, *Pseudotsuga macrocarpa*, *Torreya nucifera*. Among angiospermous plants the following are grown: *Abeliophyllum distichum*, *Broussonetia papyrifera*, *Callicarpa japonica*, *Chimonanthus praecox*, *Cornus kousa*, *C. florida*, *C. controversa*, *Dipteromia sinensis*, *Franklinia alatamaha*, *Heptacodium miconioides*, *Maackia amurensis*, *Magnolia denudata*, *M. wilsonii*, *M. fraseri*, *Nothofagus antarctica*, *Oxydendrum arboretum*, *Pterostyrax hispida*, *Sinocalycanthus chinensis*, *Skimmia japonica*, *Stewartia* sp. (5 species), *Symplocos chinensis* and bamboos – *Sasa*, *Pseudosasa*, *Phyllostachys* and *Sinarundinaria*.

## Conclusions

The dendrological garden of Glinna near Szczecin (north-western Poland) is one of the most interesting such places in Poland, famous for growing of many unique tree species. The garden's collection amounts up to 632 taxons representing 199 genera and since 1970 has been enlarged by prof. J. Tumiłowicz. The unique local microclimate and favourable growing conditions allow to acclimate shrubs and trees coming from temperate climatic zone and would not grow in other regions of Poland. There are also carried out research on adaptation of alien tree species to variable environmental conditions and their usefulness for different pragmatic application – herbal treatment, aesthetic purposes, honey production e.t.c. The Centre of Natural-Forest Education, situated near the Glinna arboretum, serves scientific, educational, social and recreation purposes.

## References

- Heinze, D. Schreiber, 1984, Eine neue Kartierung der Winterhärtezonen für Gehölze in Europa. Mitt. Dtsch. Dendrol. Ges. 75, 11-56.
- Kubus, M., A. Łysko, 2006, Mapa cyfrowa kolekcji ogrodu dendrologicznego w Glinnej k.
- Szczecina, nowe możliwości naukowo-edukacyjne. Materiały konferencyjne XXXV.
- Zjazdu Ogrodów Botanicznych w Polsce, Ogrody botaniczne w Unii Europejskiej – nowe zadania i wyzwania. 9-11 października 2006 r., Przelewiec, s. 15.
- Tumiłowicz, J., 1994, Wyniki uprawy drzew i krzewów obcego pochodzenia w Ogródku Dendrologicznym w Glinnej. Roczn. Dendrol. 4, 49-61.
- Tumiłowicz, J., 1996, Ogród Dendrologiczny w Glinnej pod Szczecinem (przewodnik), Szczecińska Agencja Turystyczna SAT, Szczecin.
- Tumiłowicz, J., Z. Pajewski, 1999, Ogród Dendrologiczny w Glinnej (folder). ComGraph, Szczecin.
- Tumiłowicz, J., 2002, Ogród Dendrologiczny w Glinnej. Roczn. Dendrol. 50, 141-152.
- Tumiłowicz, J., 2006, Arboretum w Glinnej, W: Ze Stargardu nad Iną do Nowego Warpna.
- Okolice, Tajemnice, Szlaki Pomorza Zachodnie. Pod red. A. Stachak. Szczecin 99-117.
- Van de Laar h.j., De Jong, 1995, Naamlijst van houtige gewassen, Proefstation voor de Boomkwekerij, Boskoop.
- Index Plantarum polskich kolekcji dendrologicznych, 1999, Red. T. Nowak. Pr. Ogr. Bot. Uwr. 5,1, Wrocław 17-305.