Magnolias in Poland

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It will not be possible for readers to interpret the results of the introduction of magnolias into Poland if climatic conditions are not, even briefly, characterized. Poland is situated in Central Europe between the latitude of 49°N and 54°N and the longitude of 14°E and 24°E. It is mostly low lying country; the average elevation is 568 feet. The mean annual temperature ranges from 43°F in the northeast to 48°F in the southwest. The absolute minimum temperatures recorded in the 20th century ranged from -44°F in the mountains to -33°F in the lowlands. The mean annual rainfall ranges from 59 inches in the mountains to 30 (in some areas even 18) inches in the lowlands. The climate of Poland is transitional between the continental climate of Eastern Europe and the maritime climate of Western Europe. It causes the weather in Poland to be exceptionally variable. Winter conditions, which are the most critical for plant introduction, can be particularly unsteady. Besides relatively mild winters, there have been periodically very severe winters of the Siberian type with abundant and long persisting snow cover as well as winters of the steppe-desert type with practically no snow cover. Such extremely cold winters, with temperatures often down to -25°F, occurred in 1928/29, 1939/40, 1955/56, 1962/63, and 1969/70, 1978/79, and 1986/87.

The winter of 1928/29 was preceded by a period of over 50 years with rather mild winters. During this time many marginally hardy plants were introduced into Poland including such trees as *Sequoiadendron giganteum*, *Cedrus atlantica*, *Cryptomeria japonica*, and *Ilex aquifolium*. The severe winters, which followed that unusually favorable period, dramatically reduced the number of exotic plants growing in Poland. The species which survived those extremely harsh winters can be considered as sufficiently hardy to be cultivated in Central Europe. It should also be added that prolonged periods of warm and wet weather in fall, short warm spells followed by sudden drops of temperature in winter, and spring drought as well as late and early frost—all greatly influencing successful introduction—are very common in Poland.

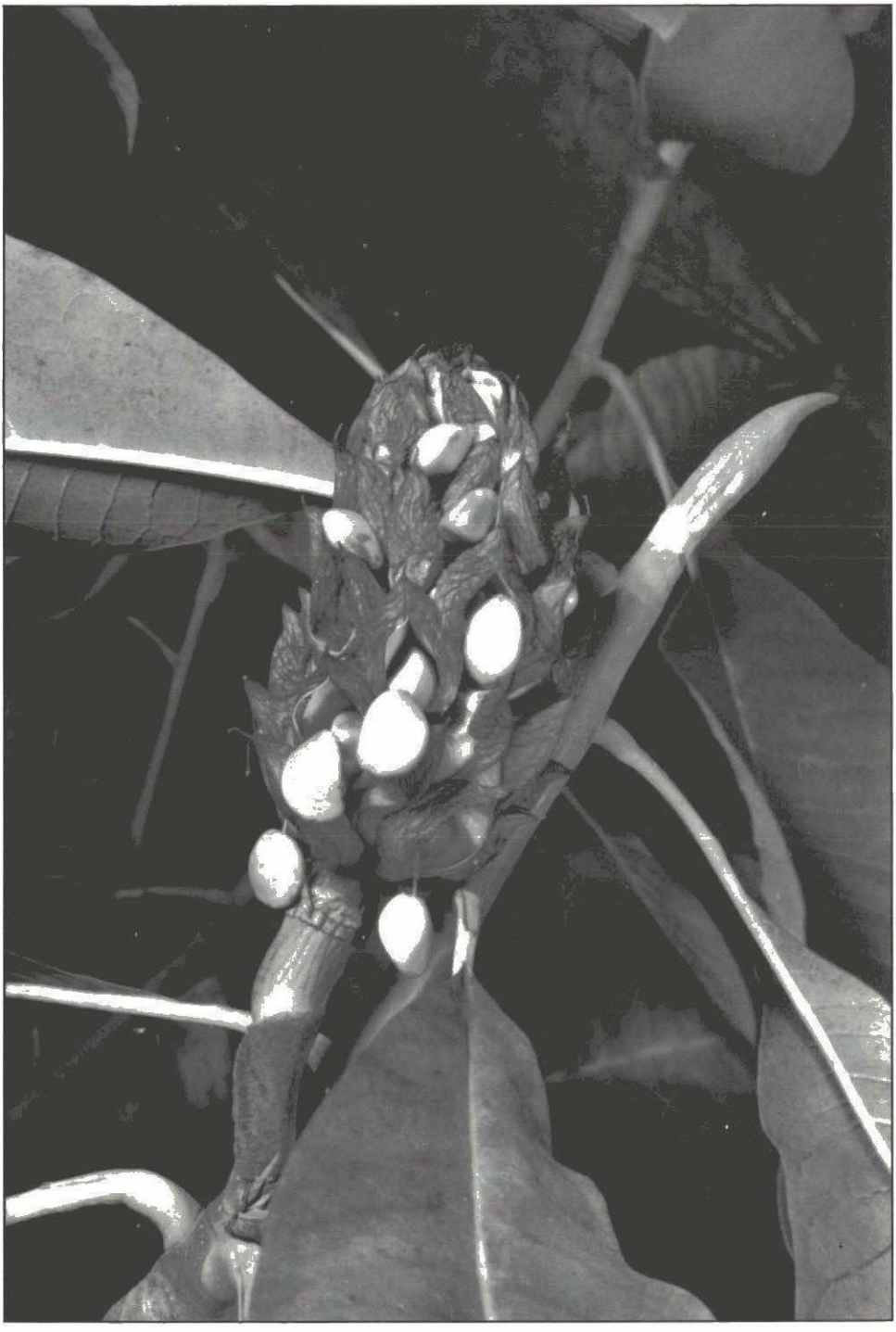
None of the modern species of magnolias is native to Poland, however, magnolias grew in this part of the continent 100 million years ago during the Cretaceous period. Fossil seeds of the extinct species *Magnolia cor* Ludvig, closely related to the modern species *Magnolia kobus* DC have been found

in Kroscienko on the Dunajec River (southeastern Poland) by Professor Szafer (Bugala, 1956).

According to the first documented records known to the authors, the introduction of magnolias into Poland dates from the beginning of the 19th century. A catalog of the Warsaw Botanic Garden published by Shubert in 1824 listed *M. tripetala* and *M. acuminata*. Between 1818 and 1838 the following magnolias were introduced by Count Wodzicki at his famous arboretum at Niedzwiedz near Cracow: *MM. acuminata, coco, cordata, denudata, fraseri, grandiflora, liliiflora, liliiflora* 'Gracilis,' *macrophylla, kobus, pyramidata,* x *soulangiana,* x *soulangiana* 'Alexandrina,' x *soulangiana* 'Speciosa,' x *thompsoniana, tripetala,* and *virginiana* (Wodzicki, 1820 and later). Loudon (1838) mentioned Niedzwiedz in his *Arboretum et Fruticetum Britannicum*: "(...) At Niedzwiedz, about three miles from the city, Count Wodzicki, a gentleman who has never been out of Poland, began, in the year 1814, to plant an arboretum; and he pursued his plan with such energy, that in 1836 his collection amounted to nearly 200 species and varieties, exclusive of half-hardy species, which he keeps in conservatories, or against walls.(...) Though Count Wodzicki, as he informs us, was upwards of 61 years of age when he commenced his arboretum, and consequently, in 1836, must have been 83 years old, his passion for trees was then by no means diminished. He was in constant correspondence with Messrs. Booth of Hamburg, M. Soulange-Bodin of Paris, and various commercial cultivators and amateurs, and he spares no expense in procuring every new ligneous plant that is likely to stand the open air at Cracow.(...)" It is an irreplaceable loss that the work of Count Wodzicki was not continued by his successors. The arboretum at Niedzwiedz no longer exists.

Kórnik Arboretum, today's best known Polish collection, founded by the Dzialynski family, received between 1845 and 1849 such magnolias as: *MM. acuminata, fischeri* [cultivar of *M.* x *soulangiana* per *Check List of the Cultivated Magnolias*, 1975], *liliiflora, macrophylla, obovata,* x *soulangiana, tripetala,* and *virginiana*. Most of these magnolias came from J. Booth and Sons Nursery in Hamburg, Germany. Of these original plants only 3 magnificent specimens of *M. acuminata* are still growing in the Kórnik collection. At the present time, there are 23 species, hybrids and cultivars of magnolias growing in the Kórnik Arboretum (Bojarczuk, personal communication). Three of them are not discussed in this paper.

There are mature specimens of 15 species and hybrid magnolias growing in Poland. Most of them have been planted in the western and southern part of the country due to more favorable climatic conditions. The most extensive survey aiming at evaluation of hardiness of magnolias in Poland has been undertaken by Chylarecki (1974). The author included nearly 350 sites with mature, at least 30 years old, magnolias throughout the country in his studies. Mean injury degrees,



Magnolia tripetala

ranging from 1 (no injury) to 6 (all parts above ground killed), quoted in this paper after Pukacki (1978) were determined on the basis of 30 years of observations which included 5 severe winters.

M. acuminata L.

Cucumbertree Magnolia is rather common in Poland. It has proved to be the most hardy magnolia in our climate. Mean injury degree 1.0. At the same time, the resistance of this species is the most uniform throughout the country. In laboratory tests conducted by Pukacki (1978), one-year-old shoots of Cucumbertree Magnolia sustained freezing to -31°F. In Chylarecki's studies no signs of injury have been observed regardless how harsh the winter conditions have been. Old Cucumbertree Magnolias (in Gdansk-Oliwa, Kamieniec Zabkowicki, and Sledziejowice) are over 70 feet tall and their trunks reach 47 inches in diameter. This species is highly recommended in Poland.

Introduction: 1820 Niedzwiedz, 1845 Kórnik.

M. denudata Desrouss.

Yulan Magnolia is rarely grown in Poland. Its hardiness is limited and can be compared to that of Saucer Magnolia. A severe winter may cause damage of buds and spurs but trees usually regenerate pretty well in spring. The biggest specimens (in Torun, Wroclaw, and Poznan) reach a height of 20 feet and 4 inches in diameter.

Introduction: before 1820 Niedzwiedz.

M. kobus DC. and *M. kobus* var. *borealis* Sarg.

Kobus Magnolia is even more popular than Cucumbertree Magnolia. This species is also considered to be the second most hardy magnolia in Poland. Mean injury degree 1.0. However, in contrast to Cucumbertree Magnolia, there is considerable variation in terms of hardiness between various individuals of Kobus Magnolia. Such characteristic seems related to the large geographic range of this species. Its flower buds may be damaged only during extremely cold winters. The biggest trees of Kobus Magnolia (in Krosno, Pelkinie-Wygarki) are 46 feet tall with trunks reaching 12 inches in diameter.

Introduction: 1820 Niedzwiedz.

M. liliiflora Desrouss.

Probably more commonly grown than the straight species is its cultivar 'Nigra.' The hardiness of Lily Magnolia varies significantly within a population but generally is sufficient to recommend this species in Poland. The best specimens reach a height of 23 feet and 10 inches in diameter (in Jaroslaw and Lancut).

Introduction: 1820 Niedzwiedz, 1848 Kórnik.

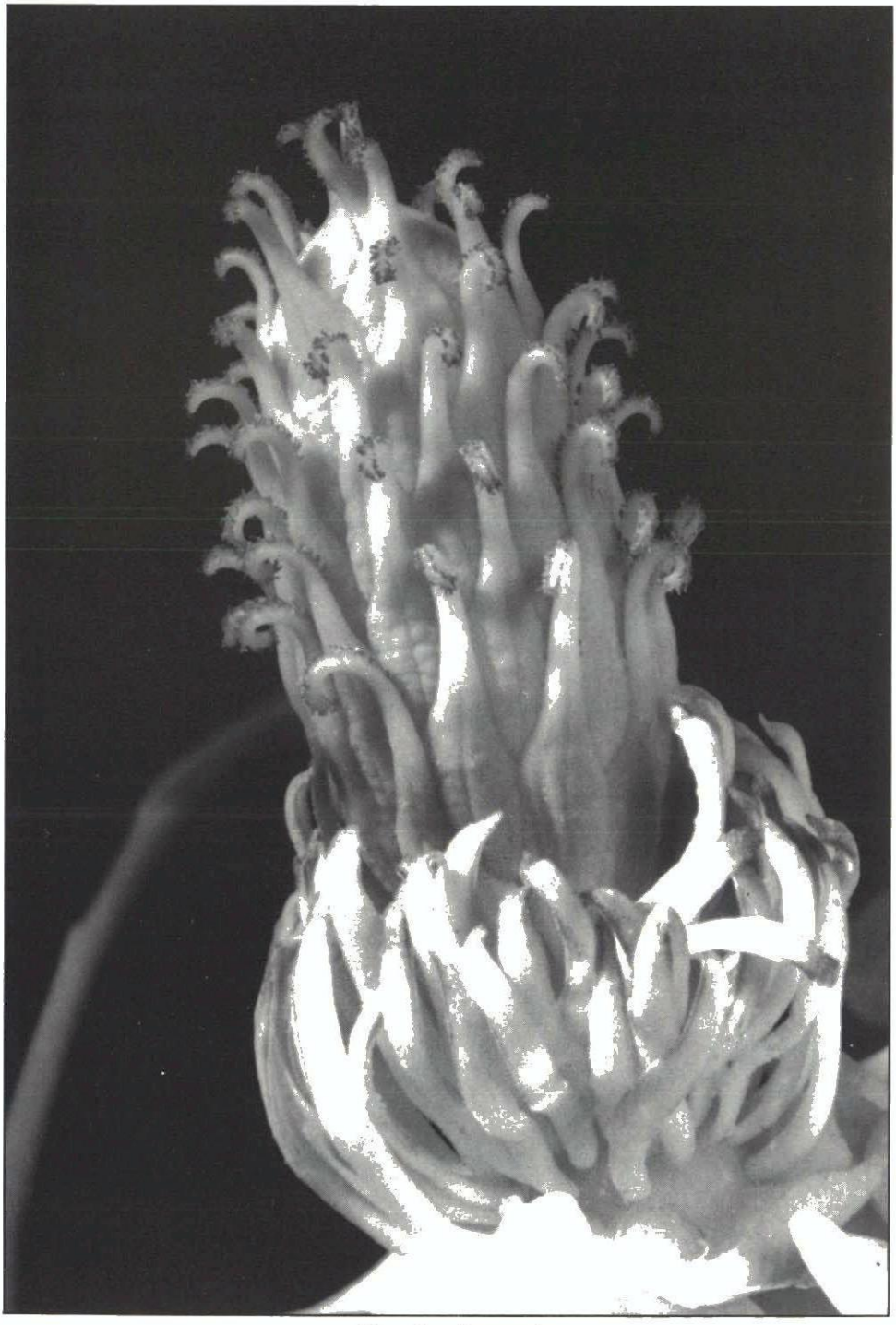
M. x *loebneri* Kache. (*M.* 'Loebneri')

Loebner Magnolia is regarded as less hardy than Cucumbertree or Kobus Magnolia. Even so, winter injury is usually insignificant. Mean injury degree 1.6. The biggest specimen in Poland grown in the Kórnik Arboretum and is over 20 feet tall and 5 inches in trunk diameter.

Introduction: 1938 Kórnik.

M. obovata Thunb. (*M. hypoleuca* Sieb. *et* Zucc.)

White Bark Magnolia is not very common in Poland. However, this species is recommended due to its



Magnolia x thompsoniana

considerable hardiness. Mean injury degree 2.0. In the past White Bark Magnolia was tested in Europe, particularly in Germany, as a tree potentially suitable for the timber industry (Bugala, 1956). The best specimen in Slawecice is over 40 feet tall and 12 inches in diameter.

Introduction: 1845 Kórnik.

M. salicifolia Maxim. and *M. salicifolia* var. *concolor* Miq.

Highly recommended in Poland because of its remarkable hardiness. Mean injury degree 1.0. So far it has not been cultivated widely. Other than the over 20 foot tall tree in the Kórnik collection, no outstanding specimens of Anise Magnolia have been recorded in our country.

Introduction: 1935 Kórnik.

M. sieboldii K. Koch

Oyama Magnolia is rarely grown in Poland. Nevertheless, this species is regarded as one of the most hardy. Its resistance is similar to that of Kobus Magnolia. Mean injury degree 1.0. One-year-old shoots of Oyama Magnolia sustained freezing to -31°F under laboratory conditions (Pukacki, 1978). Mature specimens of Oyama Magnolia can be seen in the Kórnik Arboretum and the Rogow Arboretum.

Introduction: 1958 Kórnik.

M. sinensis Stapf.

This very rare in Poland Chinese Magnolia grows in the Kórnik Arboretum. This plant was introduced from Dublin Botanical Garden (Ireland) in 1936. The earlier introduction from Kew Gardens in 1933 was not successful. In the winter of 1939/40 and 1955/56 the Chinese Magnolia was damaged down to the snow line. Since that time, however, the plant has withstood the climate of Kórnik quite well. It is recommended to protect this magnolia with spruce branches for winter. The specimen at Kórnik is over 12 feet tall. Seeds produced by this plant germinated very well but young seedlings tend to continue growth in the late fall that predisposes them to early frost. That is also very true about seedlings of other magnolias propagated in Poland.

M. x *soulangiana* Soul. and its cultivars 'Alba Superba,' 'Alexandrina,' 'Amabilis,' 'Lennei,' 'Purpurea,' 'Rustica Rubra,' and 'Speciosa'

Hardiness of Saucer Magnolia varies significantly from specimen to specimen if propagated from seeds. Many of them are relatively resistant. Mean injury degree 3.0-4.4, but 'Amabilis' 2.8. Pukacki (1978) selected numerous old trees of Saucer Magnolia tolerating perfectly the winters of southeastern Poland where minimum temperatures of -30°F or lower are not uncommon. Though this hybrid is often subject to late frost, trees exceptionally resistant to such damage have been found in Strzekocin (Chylarecki, 1974). This magnolia produces fertile seeds only in the southeastern region of the country. It seems to be related to a long growing season and high solar radiation (over 62.5 kcal/cm^2) occurring in that area (Chylarecki, 1974). Generally, Saucer Magnolia is recommended in Poland, and, in fact, it is the most commonly grown magnolia in the landscape. The biggest specimens of Saucer Magnolia (in Luban Slaski, Szczecin, Sledziejowice, Raciborz, and Witkowice) reach a height of 46

feet and 17 inches in trunk diameter.

Introduction: 1833 Niedzwiedz, 1848 Kórnik.

M. stellata Maxim. and *M. stellata* 'Rosea'

Star Magnolia represents a limited hardiness like Saucer Magnolia in Poland. Flower and leaf buds as well as spurs have been injured by frost during most severe winters. Some variation in hardiness has been observed. Mean injury degree 3.0, but 'Rosea' 3.2. The specimens in the Kórnik, Wojslawice, and Przelewice Arboreta reach a height of 27 feet and trunk diameter of 9 inches.

Introduction: 1928 Kórnik.

M. tripetala L.

Trees of Umbrella Magnolia in Poland vary in their hardiness, but most of them are regarded as marginally hardy. Mean injury degree 4.6. They have high ability to regenerate winter injury as observed after the winter of 1962-63 when Umbrella Magnolias were seriously damaged (Bugala and Hlyniowa, 1965). The biggest trees of this species (in Wiekszyce, Krasiczyn, Sledziejowice, and Bilczyce) are over 30 feet tall and 12 inches in trunk diameter.

Introduction: 1820 Niedzwiedz, 1845 Kórnik, before 1824 Warsaw.

M. x *thompsoniana* Sarg.

Hardiness of this extremely rare in Poland hybrid is uncertain. In Pukacki's studies mean injury degree of *M.* x *thompsoniana* was rated 5.0. The best specimen of this magnolia grows in the Kórnik Arboretum.

Introduction: 1828 Niedzwiedz.

M. virginiana L.

Sweetbay Magnolia, though rare in Poland, is recommended as a valuable tree. Severe winters may cause desiccation of its semi-evergreen leaves as well as some damage of one-year-old stems, but three usually resprouts from older wood pretty well. Mean injury degree 2.8. Reports on its hardiness in Poland are inconsistent.

Introduction: 1820 Niedzwiedz, 1845 Kórnik.

M. wilsonii Rehd.

Wilson Magnolia is probably the least hardy species among those growing in Poland. Its marginal hardiness limits the use of this magnolia only to warm and well protected areas in the western part of the country.

Introduction: 1935 Kórnik.

Magnolias are propagated commercially in Poland in several nurseries and the following species and cultivars are available on the market: *MM. acuminata*, 'Betty,' *kobus*, *kobus* 'Rogow,' *liliiflora* 'Nigra,' *obovata*, *sieboldii*, x *soulangiana* 'Alba Superba,' x *s.* 'Alexandrina,' x *s.* 'Amabilis,' x *s.* 'Lennei,' x *s.* 'Picture,' x *s.* 'Purpurea,' x *s.* 'Speciosa,' *stellata* 'George H. Kern,' *stellata* 'Rosea,' and 'Susan.'

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