Results of woody plant introduction in the Vilnius University Botanical Garden (1781–2000)

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Vilnius University (VU) Botanical Garden established in 1781 by the famous French botanist Professor J. E. Gilibert was and is one of the main centres of exotic plant introduction in Lithuania. The present paper deals with generalisation of the results on winter-resistant (under Lithuania's climate conditions) woody plant introduction carried out in 1781–2000 in the VU Botanical Garden. The woody plant collection in the VU Botanical Garden was especially enriched in the last decades of the 20th century. The Garden became the largest centre of introduction of exotic woody plants in Lithuania.

Key words: woody plant, introduction, Vilnius University Botanical Garden, 1781–2000

INTRODUCTION

Winter-resistant plants occupy a special place in the VU Botanical Garden. During the first years of existence of the Garden, in the 19th century and even early in the 20th century, they made only a small part of the total collection [1, 2]. Now these plants make up about 40% (more than 3500 taxa) of the plants cultivated in the Garden. The present paper deals with generalisation of the results on woody plant introduction in the VU Botanical Garden during the entire period of its existence (1781–2000).

OBJECTS AND METHODS

We shall discuss the results of only a traditional dendrological set of investigations of woody plants (hardy in Lithuania), *i.e*., covering plants of the whole historical collection and those growing now in the Departments of Dendrology and Plant Systematics and Geography.

The data about historical collections of the VU Botanical garden were taken from various historical sources, including 45 garden catalogues and plant inventories, as well as some published works [3–5, etc.].

The size of woody plant collections has been determined and their structure analysis has been done according to taxonomy and plant origin. The data obtained enabled to distinguish in the VU Botanical Garden four historical and four modern collections of woody plants differing both in the period of time and in structure [2].

For evaluation of introduction results, the basic factors (duration of cultivation, fruit-bearing capacity, propagation and spreading possibilities in Lithuania) were chosen. These aspects are most important for a successful cultivation of introduced woody plants and also best reflect the results of introduction [6].

RESULTS

In the 18th c. the plant collection in the VU Botanical Garden was formed with an educational cognitive purpose [1]. Unfortunately, the collection which prospered for a short time (1782–1787) was neglected by the beginning of the 19th c. This resulted in losses of many plants, including dendroflora. From the 18th c. dendroflora collection, only 48 taxa of woody plants survived into the next century. Some of them, however, were successfully growing till 1841 when the Garden was liquidated. Such were, for instance, *Caragana arborescens* L., *Colutea arborescens* L., *Genista tinctoria* L., *Gleditsia triacanthos* L., *Laburnum anagyroides* Med. *Robinia pseudoacacia* L., *Cydonia oblonga* Mill., *Ptelea trifoliata* L., *Salix babylonica* L., *Staphylaea pinata* L. and some other plants. Some of them had reached the maturity phase, their seeds and seedlings were being spread in Lithuania.

The data available show that in the 18th c. woody plants from South and Southeast Europe and West Asia prevailed in the VU Botanical Garden. These data, however, do not seem reliable, since no list of

the plants grown at that time survived, moreover, the sources of that time are rather controversial [3, 7, 8].

In the 19th c. the collection of woody plants expanded significantly (it was the largest in 1828 with its 420 taxa). In the 19th c. attempts were made to cultivate woody plants of 568 names in the VU Botanical Garden. But the cultivation of 485 of them took more time (some or several years). At that time the VU Botanical Garden was the largest plant introduction centre in Lithuania [9]. In the 19th c. representatives of North American dendroflora grew rapidly in number, and soon they made up the richest group of woody plants (31.5% of the total taxa of these plants). At that time the following representatives of North America were introduced: *Castanea dentata* Marsh. (introduced in 1820), *Castanea pumila* (L.) Mill. (1820), *Quercus rubra* L. (1820), *Ribes aureum* Pursh. (1827), *R. triste* Pall. (1823), *Hamamelis virginiana* L. (1820), *Aesculus flava* Soland. (1808), *A. pavia* L. (1824), *A. glabra* Willd. (1827), *Carya tomentosa* Nutt. (1804), *Juglans cinerea* L., *J. nigra* L., *Liriodendron tulipifera L.* (1811), *Menispermum canadense* L. (1802), *Morus rubra* L. (1812), and many others, comprising 179 taxa. Many of them were introduced in Lithuania for the first time, whereas some others were rare there.

In the 19th c. even 227 taxa of woody plants reached the fruit-bearing stage in the VU Botanical Garden, their seeds and seedlings were spread in Lithuania and other countries. Therefore these plants are considered to represent a successful introduction. In this relation the following plants can be mentioned: *Genista tinctoria* L., *Physocarpus opulifolius* (L.), *Fraxinus pensylvanica* Marsh., *Ribes americanum* Mill., *Rhododendron ponticum* L. etc. Unfortunately, in 1841 the garden was closed, many plants pined away or were rooted out. Only the most hardy plants such as *Populus nigra* 'Italica', *Amelanchier canadensis* (L.) Med. and some others survived by the mid-20th century [9].

The results of a 20-year long introduction activities were more modest at the Stephan Batory University (SBU) Botanical Garden established at the Neris River loop in Vilnius, now Vingis Park. The collection of the dendroflora contained fruit-bearing and woody plants of only 26 taxa, many of them had already been introduced in Lithuania. From the fruit-bearing plants only *Lonicera alpigena* L. and *Buddleja davidii* Franch can be mentioned. The most abundant group (31.1% of all taxa) consisted of the representatives of Eurasia, followed by North American plants (22.5%). In general, the collection of woody plants in SBU Botanical Garden in the Vingis Park was non-traditionally small (180 taxa) if compared to collections of other gardens.

After World War II, in 1949–1990 a significantly richer collection was accumulated in Vingis. About 900 taxa of woody plants were cultivated here during that period, but only 580 taxa survived for several and more years. Representatives of East Asian dendroflora prevailed among them. Generative maturity phase was reached by 194 taxa of woody plants in Vingis. The present-day Plant Geography and Systematics Department (in Vingis) has about 210 taxa of woody plants. Many of them are fruit-bearing and produce seedlings. They are the most valuable representatives of dendroflora (from the introduction outcome point of view) not only in this collection, but in the VU Botanical Garden as a whole. Here, the following plants still rare in Lithuania bear fruits: *Phellodendron amurense* Rupr., *Coryllus americana* Walt., *Corylus colurna* L., *Morus alba* L., *Prunus mandshurica* (Maxim.) Koehne etc. For many years, specimens of *Gymnocladus dioicus* (L.) K. Koch. *Celtis glabrata* Planch, the only in Lithuania, grow in Vingis.

The present-day Dendrology Department collection of woody plants, the largest in the VU Botanical Garden, contains 2400 taxa, with those of lower rank, *i.e*. cultivars, prevailing (50.3%). Many plants of this collection are very young, and now is not the time to generalize the introduction results; this is confirmed by high instability of the collection. Nevertheless, the collection grows well and of late years woody plant seeds of 283 taxa are collected here and distributed [10]. Additionally, vegetative propagation is successfully applied for approximately 200 taxa of plants. This collection enabled to propagate about 70 taxa of new woody plants that had not been cultivated in Lithuania before. Moreover, about 500 taxa of this collection are not grown anywhere in Lithuania.

CONCLUSIONS

1. In the 18th c. the VU Botanical Garden was an important centre of plant introduction in Lithuania; but in order to make the knowledge about plant introduction via this Garden full, further investigations are necessary.

2. In the first half of the 19th c. the VU Botanical Garden became the largest centre of introduction and distribution of exotic plants in Lithuania. Many attempts to introduce new plants to Lithuania were made for the first time, but due to liquidation of the Garden in 1841 this work was interrupted.

3. In the 20th c. the role of VU Botanical Garden as a large centre of woody plant introduction was exposed only after the 60s.

4. The woody plant collection in the VU Botanical Garden was especially enriched in the last de-

cades of the 20th c. The Garden became the largest centre of introduction of exotic woody plants in Lithuania.

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SVARBESNI SUMEDĖJUSIŲ AUGALŲ INTRODUKCIJOS REZULTATAI VILNIAUS UNIVERSITETO (VU) BOTANIKOS SODE (1781–2000)

S a n t r a u k a

VU Botanikos sodas buvo ir yra svarbus augalų introdukcijos centras Lietuvoje. Atsparūs žiemai sumedėję augalai sode užima ypatingą vietą. Šiuo metu jie (apie 3500 taksonų) sudaro net apie 40% visų sodo augalų. Apie XVIII a. VU Botanikos sodo augalus išliko labai mažai duomenų, tačiau žinomi 48 pavadinimų sumedėję augalai, kurie išgyveno iki XIX a. ir daugelis jų pasiekė generatyvinę stadiją. XIX a. pradžioje VU Botanikos sodas tapo stambiausiu svetimžemių augalų introdukcijos ir platinimo centru Lietuvoje (krašte platinti 227 pavadinimų sumedėję augalai), tačiau 1841 m. sodą likvidavus šis darbas buvo nutrauktas. XX a. VU Botanikos sodo, kaip stambaus sumedėjusių augalų introdukcijos centro, reikšmė Lietuvoje išryškėjo tik nuo 6–7-ojo dešimtmečio. Sumedėjusių augalų kolekcijos VU Botanikos sode ypač pagausėjo paskutiniaisiais XX a. dešimtmečiais, ir sodas tapo stambiausiu svetimžemių sumedėjusių augalų introdukcijos centru Lietuvoje.