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## Botanic gardens in the modern world. Introduction

[https://doi.org/10.36921/kos.2023\\_2954](https://doi.org/10.36921/kos.2023_2954)

Botanic gardens are scientific institutions with a very ancient origin. Their prototype can be considered collections established in antiquity by, among others, the rulers of Egypt, Babylonia and Assyria, gathering native and exotic species of plants, or the famous Athenian Lyceum created by Aristotle at the Temple of Apollo, where the first systematic natural observations made by Aristotle students, including Theophrastus of Eresos, known as the „father of botany”.

The more modern history of gardens, already named botanic, begins in Renaissance Italy, where they find institutional support in universities. Their didactic role is also gaining importance. Since then, the idea of a botanic garden as a place to collect various plant collections, used to teach botany and pharmacognosy, and to study the properties of plants, has been spreading throughout Europe, and with the geographical expansion of Europeans, all over the world. A certain regression, caused by the rapid development of experimental and molecular fields, pushing classical and descriptive fields to the margins of science, takes place in the middle of the 20th century, however, botanic gardens are victorious over this test, quickly adapting to the new scientific reality.

Perhaps because of its long history – the oldest existing institutions of this kind are almost five centuries old – botanic gardens are sometimes still associated with a somewhat anachronistic approach to science. However, today they are thoroughly modern institutions that perform many different functions. Today, their scientific activity is not limited only to

academic teaching and classic, descriptive botanical research, but extends to many disciplines of natural sciences, including conservation biology, which is so important in the face of the biodiversity crisis. It is hard to imagine the efficient documentation and protection of the world’s flora without the participation of botanic gardens, whose rich collections contain 1/3 of all terrestrial plant species. To this, let’s add the resources of scientific knowledge about plants and the skills of their cultivation and storage, which are represented by over 60,000 specialists employed in gardens. Their priority is endangered species – a huge task on a global scale, because they already constitute 40% of the global flora.

It is even more difficult to draw public attention to the problem of species extinction without the participation of botanic gardens, and this is a key issue for intensifying efforts not only to protect plant diversity, but also the whole of nature. In order to widely communicate these and other important environmental issues and discoveries of botanical sciences, botanic gardens have now also become centers of social education, a kind of living museums, presenting the significant natural, cultural and economic role of plants. For this purpose, they use very diverse and modern means of knowledge transfer, including cultural or artistic activities.

Polish botanic gardens – and there are currently 42 of them – do not differ from this picture. Annually, they are visited by over 2.5 million people, and their total resources include almost 120,000 living plant accessions. This picture is complemented by rich herbarium collections, gene, tissues and seed

banks, as well as historical and museum collections.

Polish botanical gardens are involved in numerous scientific, conservation, educational, social and artistic projects. Thanks to the specific competences of the gardens' staff (scientists, gardeners, educators), on the one hand, they are a place of world-class scientific research (not only botanical!), and on the other hand, they are training grounds where practical ways of cultivating wild and endangered plants, the long-term storage of their seeds or tissues, and methods for their reproduction in nature are tested. All this often takes place virtually in front of thousands of visitors, which facilitates the transfer of knowledge to society and results in gardens having a large social capital and being perceived as places friendly to ordinary people, rather than hermetic and rigid scientific institutions.

In the Polish literature, there are practically no new publications that would present the role and resources of botanic gardens, in particular national ones. This monograph is therefore an excellent opportunity to rediscover botanic gardens in their contemporary and modern version, learn about their diversity, collections, scientific and social potential. Thanks to the wide thematic spectrum of this issue, readers will be able to look behind the scenes that are usually inaccessible to the average visitor, and become familiar with the entire „kitchen” of these institutions, gaining knowledge about the scale of challenges undertaken, and scientific, conservation and educational successes.

Although there are almost 3,300 botanical gardens worldwide, this number is far from sufficient to fully cover the research and protection of plant biodiversity. This is particularly difficult in the case

of organisms from areas with the highest biological richness (e.g. the tropics), because in such regions these institutions are simply missing or very underfunded. The latter problem, however, also affects botanic gardens from economically developed regions of the world, which makes it difficult to fulfill their basic functions. I hope that the current issue of *Kosmos* will also be a way to draw attention to the economic aspect of the functioning of gardens, which are key players in the protection of local and global natural resources.

I would like to thank the *Kosmos* Editorial Board, especially the Editor-in-Chief, Prof. Krystyna Skwarło-Sońta, for noticing the significant scientific and social role of botanic gardens and inviting me to edit this issue, and Ms. Marta Zabłocka for invaluable editorial support. This monograph would not have been completed without the great commitment of my colleagues from Polish botanic gardens, who agreed to join the Editorial Board of the issue and supported me in its preparation: prof. Zygmunt Kącki (University of Wrocław Botanic Garden), Dr. Paweł Kojs (Silesian Botanic Garden), prof. Arkadiusz Nowak (PAN Botanic Garden—Center for the Biological Diversity Conservation), Mr. Damian Matynia (Council of Polish Botanical Gardens and Arboreta), Dr Grażyna Szymczak (Maria Curie-Skłodowska University Botanic Garden, President of the Council of Polish Botanical Gardens and Arboreta), Prof. Michał Węgrzyn (Jagiellonian University Botanic Garden), Prof. Justyna Wiland-Szymańska (Adam Mickiewicz University Botanic Garden). I would also like to acknowledge all the Authors and Reviewers, thanks to whom this monograph gained the right form and acquired qualitatively verified content.

