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UNIVERSITY BOTANIC GARDENS - A HISTORICAL OVERVIEW

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Abstract. The Botanic Garden of the Sofia University „Saint Kliment Ohridski“ in Sofia, already boasts a 130-year history. The article provides a brief overview of the founding and development of the University Botanic Gardens and its scientific, educational, cultural, and social significance.

Keywords: botanic garden, Sofia University, Varna, Balchik

Botanic gardens appeared in Europe as gardens with medicinal plants. The oldest existing botanic garden is the Botanic Garden of Padua, in Italy. It was created in 1545 for growing medicinal plants to be used for the training of medical students. Botanic gardens were founded also in Bologna in 1568, Valencia in 1567, and in Northern and Western Europe - Montpellier in 1593, Leiden in 1587, Leipzig in 1597, Oxford in 1621, Paris in 1635, Berlin in 1646, in Amsterdam 1682, Vienna in 1754 etc. (Stern 1971, Kiehn 2008, Spencer & Cross 2017). During the Renaissance, the botanic gardens in Europe became officially accepted as institutions, often belonging to universities. Many of them maintain herbaria used for research work. Gradually, botanic gardens started to include plants without medicinal properties but considered interesting, beautiful, or exotic. There are now

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more than 400 botanic gardens in The European Union (Cheneyet. al. 2000). According to BGCI (Botanical Garden Conservation International), botanic gardens are institutions holding documented collections of living plants for the purpose of scientific research, conservation, display, and education (https://www. bgci.org/about/botanic-gardens-and-plant-conservation/).

The Botanic Gardens of the Sofia University „St. Kliment Ohridski“, represent three gardens in three locations - the cities of Sofia and Varna and the town Balchik. They were established at different time and each garden has its unique development and characteristics. The University Botanic Garden in Sofia already boasts a 130- year history.

In October 1888, the oldest university in Bulgaria was founded - the Sofia University "St. Kliment Ohridski". Open as a Higher Course of Pedagogy, after several months was renamed the Higher School, which was housed in the building oftoday's Faculty of Journalism and Mass Communications. The first three faculties were the faculty of History and Philology, the Faculty of Physics and Mathematics, and the Legal faculty. Botanical Institute at the Faculty of Physics and Mathematics was founded in 1891. The head of the institute was the first Bulgarian professor in botany Stefan Georgiev (1859 - 1900). The main direction of research work at the institute was floristics - Stefan Georgiev studies mainly the higher flora of the country, his assistant Stefan Petkov studies the green algae, and Sava Kazandzhiev studies lichens. Only a year after the foundation of the Botanical Institute (in 1892), under the leadership of Prof. Georgiev, the Sofia Botanic Garden has been established (Stanev 2010; Kitanov & Chakarov 2017).

In the first years after the establishment of the Botanic Garden, Prof. Georgiev did all the work himself. Whenever wasn’t lecturing, he spent that time collecting live plants from nature for the garden and preparing plants for the herbarium. To Prof. Georgiev, the Botanic Garden and the herbarium were some of the most important links of the Botanical Institute, closely related to the teaching of botany and research work. A hothouse was built in the garden for which he ordered from Erfurt in Germany the delivery of orchids, cacti, poinsettias, and other exotic plants. On January 1, 1896, the gardener’s position at the School of High Education was taken by Karl Neff, son of the Swiss gardener Daniel Neff and with his help, the University Botanic Garden was completed. Prof Georgiev made great efforts to expand the botanic garden by joining the abandoned municipal park at the Doctor monument in Sofia. His idea was to build an arboretum in this place with different native and foreign plant species. Due to some problems in maintenance after Georgiev’s death, the management of the Botanic garden at the Doctor monument was handed back to the Municipality of Sofia (Stanev 2017; Kitanov & Chakarov 2017).

At various times the Botanic Garden was under the direction of famous botanists as academician Prof. Nikolai Stojanov (1883 - 1968), who was also head of the Department of Special Botany (later renamed as Plant Systematics and

Phytogeography) (1936 - 1951) at the Faculty of Physics and Mathematics at the University of Sofia and academician Prof. Daki Jordanov (1893 - 1978), who was Head of the Department of Plant Systematics and Plant Geography, Head of the Faculty of Physics and Mathematics (1947 - 1950), and Rector of the University of Sofia (1956 - 1962). Later, Prof. Boris Kitanov (1912 - 1996) who was Head of the Department of Plant Systematics and Phytogeography at the Biological Faculty from 1965 - 1973 (Stanev 1993, Stanev 2008).

In 1955, by order of the Minister of Culture and Education, the University Botanic garden in the town of Balchik was founded, under the guidance of Prof. D. Jordanov. The design of the garden is done with the participation of the garden designer Nicola Minchev and the first technical park manager Nikola Momchilov (Pavlov 2002). Prof. D. Jordanov was director of the University Botanic garden in Balchik until 1978.

Until 1977 the Botanic Garden in Sofia was under the management of the garden designer Nicola Minchev. In 1977 the specialist biologist Spas Popov was appointed as manager of the garden, under the direction of Prof. Elissaveta Bozhilova from the Department of Botany. During these years, an exchange of seeds has already taken place both with the Botanic Garden in Balchik and with Botanical Gardens from all over the world. According to S. Popov, seeds from about 300 plant species were exchanged annually, thus the plant collections were enriched (personal conversation).

In 1977 the University Botanic Garden "Eco-Park" in the city of Varna was established. Therefore, the University Botanic Gardens become three in different cities - Sofia, Varna, and the town of Balchik.

In 1996 the botanist Dr. Krasimir Kosev, graduate of the Royal Botanic gardens - Kew and currently a member of the European Consortium of Botanic gardens, was appointed as a Director of the Botanic Gardens of the University of Sofia. Under his leadership in the last 26 years, with a lot of work and perseverance, the Botanic Gardens acquire its modern vision.

Today the University Botanic Garden in Balchik covers an area of approximately 195 decares, of which: 61 decares of architectural and park complex, a garden of 7 decares, farm buildings, and an 800th square meters greenhouse. The garden is divided into three different parts, historically and functionally:

A landscape park already shaped at the time of Queen Marie of Romania is now a monument of garden and park art.

A garden, spreading over an area of 0.7 ha, shows visitors the beauty of seasonal flower compositions (Fig. 1), alpine spots, water areas, cacti, and succulents in typical stone beds cut in Balchik rocks.

Protected area: In 2005 the territory of the Botanic Garden was declared Protected Area.

The garden is specialized in growing collections of tropical and subtropical exotic plants. It is famous for its collection of succulents and cacti - around 4000

Fig. 1. Seasonal flower compositions - University Botanic Garden in Balchik.

Fig. 2. Rosary - University Botanic Garden “Eco - Park”, Varna. 8

species. The total number of plant species in all collections is more than 4900. It is a national center for rare and endangered species under the Washington Convention and holder of the Order of Cyril and Methodius II degree for merits in science and education.

University Botanic Garden “Eco-Park” Varna is the first ecological park in the country, which combines artificial and natural ecological systems. The park is situated in an area of 360 decares. The plant collections include more than 300 species of exotic trees and shrubs, and the herbaceous plants species are more than 100 (Fig. 2).

The University Botanic Ggarden in Sofia on Moskovska str.№49 is the smallest and up till now it is located at its original site in the center of Sofia. It covers 5 decares divided into a park, a rosary and greenhouses (Fig. 3). One of the attractions of the park area is the old oak *(Quercus robur* L.) which rises in the center of the garden and is believed to be 130 years old. According to some authors, at the opening ceremony of the University Botanic garden (1982) a tree has been planted, and in its roots the Bulgarian king Ferdinand put a golden coin (**K i t a n o v & C h a k a r o v** 2017). However, according to stories by the garden designer N. Minchev,

the oak was in this place before the opening of the Botanic garden and is still older. Tsavkov & Zafirov (2016) and Ivanova (2020) provide data on an important event - the 1000th anniversary of the St. Methodius death, that took place in Sofia, in the yard of the Classical High school (today the yard of the Botanic Garden) in April 1885. Twelve young trees were then planted at a special ceremony.

To determine the age of the oak, a dendrochronological study was performed. In the winter of 2015/2016, two samples were taken with a Pressler's borer, which was processed by a special method. The number of annual growth rings was counted. According to this study, the age of the tree is set at about 140 years (Tzavkov & Zafirov 2016).

In the park rock gardens, a water pond with lilies, a wetland with moisture loving plants, and a perennial garden are separated. The perennial garden covers an area of 350 m2. The display of collections perennial herbaceous plants has been accomplished based on systematic principles. In the park area of the Botanic Garden, visitors can see remarkable tree species such as *Metasequoia glyptostroboides* Hu & W.C.Cheng, *Ginkgo biloba* L., *Eucommia ulmoides* Oliver and many others. The two trees of *M. glyptostroboides* have been grown from seeds brought by Acad. N. Stoyanov from his expedition to China in 1947 (Shopova 2019). *M. glyptostroboides* is the only species in the genus *Metasequoia*, which belongs to the Cupressaceae family. The species is a relict from the Mesozoic era.

The plants in the greenhouses are mainly cultivated for scientific and educational purposes and include well-documented collections of subtropical, tropical species and succulents. In the tall central greenhouse (Fig. 4) grow different Gymnosperms - species of the genus *Araucaria, Cycas, Zamia, Dioon,* as well as different species of palms, including *Livistona chinensis* (Jacq.) R.Br. ex Mart. and high variety of

Fig. 3. Map of the University Botanic Garden in Sofia. **Legend:** A, B, C, D, E, F - Greenhouses; G - Rosary garden; H - Perennial garden; I - Pond with lilies; J - Wetland with moisture loving plants; K, L, M - Rock gardens.

Fig. 4. The tall central greenhouse - University Botanic Garden in Sofia.

tropical plant species - *Strelitzia nikolai* Regel & K.Koch, *Monstera deliciosa* Liebm, *Musa mannii* H.Wendl. ex Baker etc. In the greenhouse "Humid tropic conditions" the visitors can see epiphytes such as orchids, bromeliads, and ferns. There is also a greenhouse with succulents and a tall greenhouse with large size species of Cactaceae and Euphorbiaceae family, as well as a greenhouse with Mediterranean plant species. The University Botanic Garden in Sofia keeps and preserves more than 1500 plant species.

In recent years, a park place called Pharmacy Garden has been developed, where visitors and students can get acquainted with various medicinal plants and learn more

about their importance for medical use.

University Botanic Gardens are members of the World Botanical Gardens Council (BGCI), the European Botanic Gardens Consortium (EBGC), and the Botanical Gardens Environmental Education Network (EBGEN) and participate with their collections in the exchange of Index Seminum seeds with botanical gardens from the whole world.

University Botanic Gardens play an important role in promoting and protecting plant biodiversity. The collections of the gardens are an important base for research and education in plant sciences.

CONFLICT OF INTERESTS

The author declare that there is no conflict of interests regarding the publication of this article.

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