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CHRONICLE

Department of Dendrology of the M.M. Gryshko National Botanical Garden of the NAS of Ukraine: achievements and research prospects

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Abstract

The Department of Dendrology traditionally conducts research on the biology, ecology, breeding, and cultivation of introduced and native woody plants, with an emphasis on their stability. Observations are carried out on a stationary basis in the systematic collections of the Arboretum of the M.M. Gryshko National Botanical Garden of the National Academy of Sciences of Ukraine (NBG) and in the plantings of Kyiv. The scientific direction "Geobotanical Park Science" involves the assessment of certain types of garden and park landscapes by comparison with native forests, based on which, or in place of which, the park was created. In the direction of developing the theory of the phytogenic field, new data were obtained on its communication aspect and impact on morphogenetic processes. A collection policy was developed to outline the directions of development of the Arboretum collections. Based on many years of phenological observations, it was found that changes in average annual temperature over the last climatic period shifted the dates of the onset of the initial phases of development in model plants. Studies of reproductive biology have revealed that the largest number of juniper seeds are aborted during the pollination-fertilization stages; that the quality of pine seeds depends on the number of trees in a single-species group; and that forsythia seeds in the NBG collection are produced in small numbers due to the predominance of clones with long staminal filaments. The result of the department's breeding programs is the production of complex high-yielding hybrids of the genus *Salix* L. for the needs of renewable energy, landscaping and phyto-amelioration; dwarf seedlings of the fruit-bearing form of Chinese lilac (*Syringa* × *chinensis* f. *fructiferum* Gorb.), which have significant prospects for becoming a dwarf rootstock for varieties of common lilac; decorative cultivars of the genera *Pinus* L. and *Picea* A.Dietr. Biotesting of soils at a site with perennial cultivation of *Syringa vulgaris* L. plants showed higher soil toxicity in areas with intensive anthropogenic load. A comprehensive assessment of the resistance of plants of the genus *Hamamelis* Gronov. ex L. revealed that *H. mollis* Oliver is more resistant to insufficient moisture levels. For Rutaceae Juss. representatives, there is no clear fixation of a single reproductive system; a wide range of forms characterizes them, from hermaphroditic to dioecious, with numerous intermediate states. Comprehensive studies of this family have revealed species- and sex-specific differences in metabolite accumulation and drought resistance.

Keywords: breeding, plant resistance, dendrology, garden and park landscapes

Authors' contributions: Yurii Klymenko, Oleksandr Horielov, Olga Pokhylchenko, Vasyl Gorb, Oleksii Horielov, Yulia Krugliak, Nataliia Dovhaliuk, Oleksandr Paraschuk, and Borys Honcharenko – writing – original draft. Yurii Klymenko – conceptualization, supervision, validation, writing – review & editing.

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Introduction

The Dendrology Department is a scientific unit of the M.M. Gryshko National Botanical Garden of the NAS of Ukraine (NBG). The scientists of the department carry out fundamental and applied research on the introduction, biology, and ecology of woody plants and their groups; breeding; conservation (especially of species with high conservation status); enrichment of plant diversity; park phytocenology; and monitoring the condition of plantings of artificial objects of the nature reserve fund. The Dendrology Department was founded in 1944, and the arboretum covers ca. 30 ha. Despite the objective difficulties of previous years, the department's team continues to preserve and enrich the collection fund, which in 2025 comprised over 1,000 species, varieties, hybrids, and cultivars. Besides this, the department works on the development of traditional areas and initiates new areas of scientific research. It also involves volunteers and sponsors to maintain the proper condition of the collections.

Among the published monographs that have already become dendrological classics and have not lost their scientific significance today, it is worth noting the reference books "Trees and shrubs. Gymnosperms" (Rubtsov, 1971) and "Trees and shrubs. Angiosperms" (Rubtsov, 1974), which provided data on the plants of the NBG's arboretum. The continuation of these publications will be the monograph "Results of the introduction of woody plants into the M.M. Gryshko National Botanical Garden" authored by Y.O. Klymenko, V.K. Gorb, Y.M. Krugliak, O.P. Pokhylchenko, N.I. Dovhaliuk, and B.V. Honcharenko. It includes data on the areas "Garden of Lilacs", "Garden of Mock Oranges", "Garden of Deutzias", and "Garden of Forsythias, Horse-chestnuts Area"; provides plans of these plots with plant designations; and summarizes the results of the 75-year introduction. In the future, it is planned to prepare similar monographs on other systematic groups from the arboretum collection.

The works "Trees and shrubs cultivated in the Ukrainian SSR: Gymnosperms" (Rubtsov, 1985), "Trees and shrubs cultivated in the Ukrainian SSR: Angiosperms" (Rubtsov, 1986), and a three-volume monograph "Dendroflora of Ukraine. Wild and cultivated trees and shrubs" (including volumes of Gymnosperms (Kokhno, 2001) and Angiosperms (Kokhno, 2002, 2005)) already became classics. The continuation of these publications was the collective bilingual monograph "Maintaining collections of gymnosperms in Ukraine: achievements, challenges, and prospects", edited by N.S. Boiko (2023) jointly prepared and coordinated with O.P. Pokhylchenko and N.M. Doiko from the Arboretum Olexandria and a set of authors. The main part of this monograph is a complete list of gymnosperm taxa in 67 botanical institutions of Ukraine. Data for the catalog were provided by collection curators or researchers who carried out the inventory of plantings. The total list of collections contains 213 species, varieties, and hybrids, and 774 cultivars in open ground, and 72 species, hybrids, and cultivars in Ukrainian greenhouses.

Results and discussion

The NBG's Arboretum as a base for scientific research

In the Department of Dendrology, scientists serve as curators of collections of specific systematic groups. In particular, Dr.Sci. O.M. Horielov is the curator of the section "Hydrophilic Plants". Now the collection fund of the section includes over 50 species, forms, and hybrids, the majority of which belong to the genus *Salix* L. Dr. O.P. Pokhylchenko works with a collection of gymnosperms, consisting of 103 species, 11 varieties, four hybrids, and 57 cultivars. Dr. V.K. Gorb has been the curator of the "Lilac Garden" section since 1980; his studies of this genus are presented in the monograph "Lilacs of Ukraine" (Gorb, 1989). The lilac collection has the status of National

Heritage of Ukraine. In 2025, it consisted of 11 species, seven subspecies, five interspecific hybrids, six varieties, and one form, 98 varieties of common lilac. Dr. Y.M. Krugliak takes care of the collection of the genus *Philadelphus* L., which includes 22 species, varieties, interspecific hybrids, and the collection of the genus *Deutzia* Thunb., which includes 14 species, interspecific hybrids and varieties. Dr. B.V. Honcharenko supervises the collection of the genus *Forsythia* Vahl, which includes 16 species, interspecific hybrids, and varieties.

Maintaining collections of living plants requires high-quality documentation of specimens, development of collections in accordance with an adopted collection policy, and creation of optimal conditions for selected plant groups. The conditions for international accreditation of arboretums by the ArbNet network (ArbNet, 2025) include a published collection policy, a planting plan, educational activities, and an active volunteer community.

Collections policy is a list of rules that outlines the scope and nature of the collection. The principles of the collection policy in the NBG's Arboretum are published in BGjournal (Pokhylchenko & Bobrova, 2022) and set out in the monograph "Maintaining collections of gymnosperms in Ukraine: achievements, challenges, and prospects" (Boiko, 2023).

The modern collection policy at Rubtsov's Arboretum involves selecting plants primarily from natural habitats. It includes species vulnerable in nature and species of the flora of Ukraine. The most fully represented genera within the collection are *Syringa* L., *Salix*, *Philadelphus*, *Deutzia*, *Picea*, *Pinus*, *Juniperus* L., *Tilia* L, *Acer* L., and *Quercus* L. There are also numerous cultivars of Ukrainian selection represented.

Scientific direction "Geobotanical park science"

This direction has been developed in the department for the past 35 years. The research involves assessing certain types of garden-park landscapes by comparing them with the native forests on whose land, or on whose site, the park was created. As part of these studies, landscape and planting plans were drawn up for 45 parks in Kyiv, six ancient arboretums, 52 parks-monuments of horticultural art of national importance, and one historical and cultural reserve. Using some of these materials, a doctoral dissertation was defended in 2012 (Klymenko, 2012), and the monograph "General park science" was published (Klymenko & Kuznetsov, 2015). It has been established that the landscapes and plantings in parks change over time in predictable patterns. Thus, park oaks (*Querceta roboris*) both in Kyiv and in the ancient parks of Polissya and Forest Steppe of Ukraine are replaced by *Carpineta betuli*, stands in which none of the species predominates, and stands dominated by companions of *Quercus robur* L. *Pineta sylvestris*-based parks are being replaced by hardwoods. The invasive *Acer negundo* L. is becoming increasingly important in floodplain parks. The collected database is the basis for further monitoring studies. Articles have already been published on changes in garden and park landscapes and park plantings in the Kharkiv region over about 30 years (Hryhorenko & Klymenko, 2018, 2021, 2022, 2025). Publications on monitoring studies of Kyiv parks are being prepared. They should influence the general policy in the formation of parks in the city by the Municipal Department "Kyivzelenbud".

The concept of a phytogenic field

The development of structural and functional features of the phytogenic field, their manifestations, and significance in the life of both individual plants and their groups are among the directions of theoretical research of the department (Horielov, 2012, 2021). The developed structural and functional models are characterized by cause-and-effect relationships, operators governing physicochemical and biochemical processes, and the flows of matter and energy (resource subsystem), as well as information operators that describe the regulatory, integrative, and communicative functions of this field (information subsystem). The presence of direct and feedback relationships between plant parts and plants in groups, implemented through flows of matter, energy, and information, allows us to consider them as complex, multi-level cybernetic systems. The systematization of numerous factors underlying this phenomenon enabled us to distinguish groups of material, energy, and information components.

Among the most obvious manifestations of the phytogenic field is the influence of woody

plants on the microclimate of the canopy and sub-canopy environment, or on the environment within and outside the canopy. The studies conducted allowed us to obtain numerical parameters of lighting regimes in the visible and ultraviolet ranges, temperature, and humidity, and to establish their features depending on the type and morphostructure of the model plant, seasonal dynamics, and their influence on the morphogenetic processes of woody plants. In particular, it was established that within the crown space, natural lighting for certain species can decrease by almost 20 times, the temperature by 15–18 °C, and the relative humidity of the air can increase by 1.5–1.8 times (Horielov & Horielov, 2009).

The phytogenic field is of special importance for morphogenetic processes. Studies of the role of this field in the formation of spatial structures are conducted at different levels of organization of the plant organism, ranging from the cellular and tissue levels to the morphostructural level of the whole plant (Horielov, 2021). Correlations have been determined between the morphometric characteristics of shoots and the meteorological parameters of the phytogenic field, which exhibit species differences and are largely determined by plants' light demand. It has been established that among climatic factors, the light regime plays a decisive role in the formation of the shoot system.

Today, the communicative function of the phytogenic field remains poorly studied. Promising directions here include the classification of interactions between plants and other organisms, the search for channels of these connections, and the mechanisms of such communication. Of particular interest is the study of the energy-information component of the phytogenic field, which requires new methodological approaches. What is fundamentally new here is the use of the biolocation method (Horielov et al., 2020).

Seasonal development of woody plants as an indicator of climate change

Through the efforts of the department's employees, two Ukrainian stations have been registered within the Pan European Phenology Project: the M.M. Gryshko National Biological Station of the National Academy of Sciences of Ukraine (Kyiv) and the Vysokohirny State Arboretum (Ivano-Frankivsk region). The goal of the project was to support and develop the Pan European Phenology Database (PEP725) with open, unrestricted access to data for science and education (EUMETNET, 2025).

Phenological observations in the botanical gardens of Ukraine are carried out and published by many researchers, but the results are scattered. Therefore, the possibility of systematic analysis of these data is lost. The use of the international unified BBCH scale of phenological observations of the Federal Agency for the Environment and Chemical Industry will contribute to optimizing the collection and processing of phenological observation data. To encourage the use of the BBCH scale, Ukrainian researchers have proposed logical replacements for phase designations using the methods traditionally used for coding phases on the BBCH scale (Pokhylchenko et al., 2024) and have proposed schemes for applying the scale to six plant species.

Scientists of the department have been involved in the phenological investigations of model plants for several decades. Unusually warm winters in recent years have caused gymnosperm vegetation to shift to much earlier dates (research by Dr. Pokhylchenko O.P.). This difference was greatest for most plants of the Pinaceae Spreng. ex F.Rudolphi and Ginkgoaceae Engl. families. In plants of Mediterranean origin, the initial phases were unchanged compared with those after cold winters. Cold weather in spring delays the pollination of all model plants by two to three weeks. The temperature during the first summer months is higher than the climatic norm, thereby causing earlier formation of microstrobili in Cupressaceae Gray plants with dozyme meiosis.

For plants of Hydrangeaceae Dumort. (i.e., *Philadelphus* and *Deutzia*), the initial phases of seasonal development and flowering are shifted by one to three weeks under the influence of average daily spring temperatures (research by Dr. Krugliak Y.M.). The beginning of flowering of winter-flowering plants of the genus *Hamamelis* L. (i.e., *H. mollis* Oliv. and *H. vernalis* Sarg.) during 2020–2024 fluctuated within one to one and a half months, depending on the average daily temperature of January and February. In plants of the autumn-flowering *H. virginiana* L., the timing of flowering from year to year varied by two to

three weeks, depending on the average daily temperatures in September–October.

The onset of the first phases of development in *Syringa* species (series *Syringae* and *Pubescentes*) after abnormally warm winters is shifted to February, but under cool spring conditions, flowering occurs in the middle term (research by leading engineer Dovhaliuk N.I.). Cold and dry weather in September and October affects the formation of generative buds in lilacs. The results of such observations are valuable only if they are carried out for many years. They showed a certain dependence of the onset of seasonal development phases on average daily temperatures. That is, global temperature changes shift the dates of the onset of phenological events (Pokhylchenko et al., 2019).

The growing season in *Tetradium daniellii* (Benn.) T.G.Hartley, *Phellodendron amurense* Rupr., *Ptelea trifoliata* L., *Zanthoxylum americanum* Mill. starts when the average daily temperature exceeds +10 °C for nine–ten days (research by PhD student Paraschuk O.A.). In male flowers of monoecious plants of *Tetradium daniellii*, flowering begins earlier than in female flowers (on the same individuals), which results from protandry.

Reproductive biology of woody plants

The formation of high-quality seeds by woody plants under cultivation conditions can be a key indicator of both the tolerance of model species to the conditions of the region of introduction and their potential invasiveness. The formation of a full-fledged seed is the result of the successful completion of several stages: differentiation of the floral meristem, meiosis, pollination, fertilization, and development of the embryo and endosperm. Published works on the formation of seeds in model species of the genera *Juniperus*, *Pinus*, and *Forsythia*, and on the factors affecting it, demonstrate the success of the applied methods. The results of these studies revealed that the largest number of juniper seeds are aborted at the pollination-fertilization stages (Kolodjazhenska & Pokhylchenko, 2015). Edible pine seeds (i.e., belonging to *P. sibirica* Du Tour, *P. koraiensis* Siebold & Zucc., *P. pumila* (Pall.) Regel, and *P. armandii* Franch.) successfully pass all development stages, but their quality depends on the number of trees in the same species group (Ruguzova & Pokhylchenko, 2014; Pokhylchenko, 2015; Ruguzova et al., 2016).

In the NBG collection, seeds of *Forsythia* species are formed in small numbers due to the predominance of clones with long staminal filaments in relation to floral dimorphism (Honcharenko, 2025).

Syringa fauriei H.Lev. has been recently introduced to the NBG. It blooms and bears fruit quite abundantly. The rate of its seed germination in the laboratory exceeds 98 %, while germination on light sandy soils is 45–50 % (research by Dr. Gorb V.K.).

Implementation of breeding programs

The principal work on the genus *Salix* is aimed at obtaining interspecific multistage hybrids with enhanced economic and other valuable characteristics for renewable energy, landscaping, and phytomelioration. For this purpose, the hybridization method has been improved and adapted to the conditions of the Forest-Steppe of Ukraine (Horielov et al., 2014; Horielov, 2024a).

The investigation of bud mutations in conifers and breeding work (Boiko, 2023) resulted in obtaining three new cultivars – *Picea abies* 'Boberskii' Loggynov, *P. sitchensis* 'Loggynov's Ball' Pokhylchenko, and *Pinus sylvestris* 'Gray Pear' Pokhylchenko (research by Dr. Pokhylchenko O.P.).

In 2025, the testing of four varieties of *Syringa vulgaris* L. (i.e., 'Ivan Mazepa', 'Malynovyi Dzvin', 'Smuhlianka', and 'Svitanok Oboloni') was completed (research by Dr. Gorb V.K.). The copyright certificates for these cultivars are expected in 2026. In recent years, considerable attention has also been paid to *Syringa* × *chinensis* Willd., a decorative spontaneous hybrid that has not yet become widespread in the culture of Ukraine due to its infertility. As a result of selection, its fruitful form was obtained – *Syringa* × *chinensis* f. *fructiferum* Gorb. The seed progeny of this form inherited fruitfulness and traits by 97.2 %. Hence, the uncoupling of phenotypic traits in the seed progeny of this form is insignificant, so it should be propagated not vegetatively, but by seeds. During seed propagation from this form, the Dendrology Department managed to obtain two winter-hardy and drought-resistant dwarfs. In the future, they can serve as a rootstock for creating low-

growing plants from genetically tall varieties, primarily common lilac.

Resistance of woody plants to abiotic factors

The resistance of woody plants to abiotic factors is the primary determinant of the cultivation of introduced plants. In particularly frosty winters, the shoots of most *Deutzia* species introduced to the Right-Bank Forest-Steppe of Ukraine freeze out. It was assumed that this was due to the content of anthocyanins. It was experimentally established that in the most frost-resistant plants (i.e., *D. gracilis* Siebold & Zucc.), after a decrease in air temperature, the content of anthocyanins in the shoots increased by more than 100%, while in the least frost-resistant ones, by 0.6–11.6% (Levon & Krugliak, 2017). According to laboratory studies of the water regime of *Deutzia* leaves, the most drought-resistant species are *D. gracilis*, *D.* × *rosea* (Lemoine) Rehder, and *D.* × *elegantissima* (Lemoine) Rehder (Krugliak, 2020). The findings of this experiment are consistent with the results obtained from determining stomatal parameters on the leaves of these plants (Krugliak, 2018b). According to the results of a study of the water regime of garden jasmine leaves, some of the most drought-resistant plants are *Philadelphus inodorus* var. *grandiflorus* (Willd.). A.Gray (= *P.* × *floribundus* Schrad. ex DC.), *P. schrenkii* Rupr., *P.* × *lemoinei* 'Avalanche', and *P. tenuifolius* Maxim & Rupr. The results of the experiment are generally consistent with those from studies of the stomata of these plants (Krugliak, 2018a). In 2020–2024, a comprehensive assessment of the resistance of plants of the genus Hamamelis to low winter temperatures, high summer temperatures, and moisture deficiency was carried out under field and laboratory conditions. The plants survived the winters of 2020–2024 without damage to buds and shoots. In 2020 and 2021, the summers were too hot, with a long period of no rain, so in these years, witch hazel experienced partial, and in some cases, complete dieback of leaf tissue. *Hamamelis mollis* plants were more drought-resistant, while *H. vernalis* and *H. virginiana* were less resistant. These results are also confirmed by demonstrating the potential drought resistance of plants through leaf water regime measurements and stomatal studies.

The drought and frost resistance of Rutaceae Juss. species varies significantly (research by Paraschuk O.A.). The highest resistance was demonstrated by *Ptelea trifoliata* L., with its male plants being comparably more drought-resistant. *Phellodendron amurense* Rupr. showed the lowest drought resistance, especially male plants; female plants reacted acutely, but recovered quickly, while male plants demonstrated a chronic type of stress (Paraschuk & Krugliak, 2025). *Tetradium daniellii* (Benn.) T.G.Hartley has average drought resistance and frost resistance down to −30 °C. *Zanthoxylum americanum* Mill. is characterized by high frost resistance (USDA hardiness zone 3) and, according to the literature, is drought-tolerant. In the summer of 2024, partial leaf drying was observed during a prolonged drought. Spring frosts in 2025 damaged young leaves of *Phellodendron amurense* the most, *Tetradium daniellii* and *Ptelea trifoliata* to a lesser extent, and did not affect *Zanthoxylum americanum*.

In *Forsythia* representatives introduced to the Right-Bank Forest-Steppe of Ukraine, vegetative buds were found to be more resistant than generative buds. Generative buds of *Forsythia* freeze out in the harshest winters. The highest winter hardiness coefficient was established in *F.* × *intermedia* 'Lynwood', and the lowest in *F. suspensa* 'Decipiens'. The drought resistance of plants of most representatives of the genus *Forsythia* in the Right-Bank Forest-Steppe of Ukraine is quite satisfactory. The highest water-holding capacity is in the leaves of plants *F.* × *intermedia*, *F. suspensa*, *F. viridissima*, and the lowest is in *F. suspensa* 'Decipiens' (Honcharenko, 2025).

Research helping to optimize soil conditions in collection plantations

Long-term (over 75 years) constant cultivation of *Syringa vulgaris* varieties and significant anthropogenic load during mass flowering cause various morphometric changes in their plants, primarily shortening the length and curvature of the axis of inflorescences and shoots, reducing the area of lamina, changing the natural color of the latter, etc. (Dovhaliuk, 2019). Biotesting helps obtain relatively quick information about

the presence of toxic substances in the soil (Hryhorchuk, 2016). The study was conducted in a thermostat using a test culture of *Lepidium sativum* L. Soil samples for the experiment were taken from different places in the S. *vulgaris* collection. Based on the data obtained, the phytotoxic effect was assessed and compared with the soil toxicity scale (Horova & Kulina, 2008). In the part of the collection where plants were planted in an area cleared of old lilac bushes, soil toxicity was higher than average (phytotoxic effect ranged from 41.5 to 49 %). In the part of the collection most affected by anthropogenic load, a high level of toxicity was recorded (phytotoxic effects ranged from 61.3 to 71%). Assessment of the toxicity of the collection soils by season showed that the lowest indicators were observed in summer, the highest in autumn, with a gradual decrease in winter and spring across all experimental variants.

Allelopathic activity studies

Studies of allelopathic activity have shown that, in Rutaceae, it is mediated by high levels of triterpenoids, saponins, and phenolic compounds (research by PhD student Paraschuk O.A.). The highest concentrations of these metabolites were found in *Tetradium daniellii* and in female plants of *Ptelea trifoliata*, which was accompanied by their accumulation in the soil. Under female plants of *Phellodendron amurense* and *Ptelea trifoliata*, the level of saponins exceeded the levels under male plants by 2–30 times. The high content of phenolic compounds under male plants of *Phellodendron amurense* and *Tetradium daniellii* caused phytotoxicity (inhibition of Lepidium sativum by 46–64 %). Changes in soil characteristics under female plants (higher humus, ammonia nitrogen, pH) and enrichment of tissues with Ca, Fe, K, Mg, and Zn also reflect sexual differences in metabolism of these plants.

Research on woody vegetation in urban plantings

The study of woody vegetation in urban plantings is a relevant area of work, initiated in the Dendrology Department back in the 1980s–1990s (Levon, 2008). The department's employees analyzed the current state of Kyiv green areas, the actual assortment of trees and shrubs under varying levels of anthropogenic load, and identified ways to optimize species composition (Horielov, 2024b). Analysis of the composition and sources of technogenic pollutants showed that almost 90 % of them occur as emissions from road transport, which justified the focus of the research on this type of pollutant (Horielov et al., 2021).

The damage caused by mistletoe (*Viscum album* L.) to urban green spaces, which has become particularly threatening in recent decades, is also an actual research topic. Determining the list of affected species, assessing the degree of damage, studying the mechanisms of settlement and damage, and developing methods for diagnosing settlement and combating mistletoe are the subjects of research by Dr. Horielov O.O. in collaboration with Czech colleagues. The most effective preparations were identified, and remote methods for treating affected plants using drones were developed (Bhat et al., 2022; Krasylenko et al., 2022, 2023).

Conclusions

The original theoretical directions actively elaborated in the Dendrology Department are park science and the development of the theory of the phytogenic field. An important guarantee of the reliability of the data obtained is the qualitative documentation and improvement of the arboretum's collection policy. Long-term observations of the seasonal development of model plants enabled the outlining of the impact of global climate change on them. The development of methods for determining the stability, quality of development of the reproductive sphere, and the impact of collected plants on the soil under conditions of long-term cultivation has provided new information that will be used to inform recommendations for urban landscaping, collection development, and educational programs. The experience gained and rich, well-documented collections of living plants will continue to serve as the basis for research on the comparative biology and ecology of tree species.

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Відділ дендрології Національного ботанічного саду імені М.М. Гришка НАН України: здобутки та перспективи досліджень

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У відділі дендрології традиційно виконуються дослідження присвячені біології, екології, селекції та культивуванню інтродукованих і аборигенних деревних рослин, з наголосом на їхню стійкість. Спостереження виконують стаціонарно в систематичних колекціях Дендрарію Національного ботанічного саду імені М.М. Гришка НАН України (НБС) та у насадженнях Києва. Науковий напрямок "Геоботанічне паркознавство" передбачає оцінку певних типів садово-паркових ландшафтів парків шляхом порівняння з корінними лісами, на основі яких, або на місці яких створювався парк. У напрямку розробки теорії фітогенного поля отримано нові дані про його комунікаційний аспект та вплив на морфогенетичні процеси. Для окреслення напрямків розвитку колекцій Дендрарію розроблена колекційна політика. Унаслідок багаторічних фенологічних спостережень з'ясовано, що зміна середньорічної температури за останній кліматичний період спричинила зміщення дат настання початкових фаз розвитку модельних рослин. Вивчення репродуктивної біології виявили, що на етапах запилення-запліднення абортується найбільша кількість насіння ялівців, якість насіння сосен залежить від кількості дерев в одновидовій групі, насіння форзицій у колекції НБС формується в незначній кількості внаслідок переважання клонів з довгою тичинковою ниткою. Підсумком виконання селекційних програм відділу є отримання складних високопродуктивних гібридів роду *Salix* L. для потреб відновлювальної енергетики, озеленення та фітомеліорації; карликових сіянців плодоносної форми бузку китайського (*Syringa* × *chinensis* f. *fructiferum* Gorb.), які мають значну перспективу стати карликовою підщепою для сортів бузку звичайного; декоративних культиварів родів *Pinus* L. та *Picea* A.Dietr. Біотестування ґрунтів на ділянці з багаторічним вирощуванням рослин *Syringa vulgaris* L. показало вищий рівень їхньої токсичності в місцях з інтенсивним антропогенним навантаженням. Комплексним оцінюванням стійкості рослин роду *Hamamelis* Gronov. ex L. встановлено, що стійкішим до недостатнього рівня вологи є *H. mollis* Oliver. Для представників родини Rutaceae Juss. не спостерігається чіткої фіксації одного типу статевої системи, їм притаманна широка варіабельність форм – від гермафродитних до дводомних, із наявністю численних проміжних станів. Комплексні дослідження цієї родини виявили видові та статеві відмінності у накопиченні метаболітів та стійкості до посух.

Ключові слова: селекція, стійкість рослин, дендрологія, садово-паркові ландшафти