

CONSERVATION AND STUDY OF RARE PLANT SPECIES IN THE DENDROLOGICAL PARK OF THE BIOSPHERE RESERVE “ASKANIA NOVA”

HAVRYLENKO Nina

The F.E. Falz-Fein Biosphere Reserve “Askania Nova”

National Academy of Agrarian Sciences of Ukraine

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One of the most serious challenges facing humanity today is the preservation of the environment and, in particular, biological diversity. In the field of vegetation protection, the defining international project is the Global Strategy for Plant Conservation [1], which provides for various ways of their conservation and rehabilitation within the former habitats. In connection with its tasks, the role of botanical gardens and dendrological parks (which belong to the natural reserve fund of the country in Ukraine) in the maintenance, study and protection of phytodiversity is increasing, which is urged to help suspension the loss of plant species, implement practical measures for their conservation and ensure the long-term use of plant resources by present and future generations.

The Dendrological park “Askania-Nova” of national importance is a part of the F.E. Falz-Fein Biosphere Reserve “Askania-Nova” which is a scientific research environmental institution of national and international importance. The Park is unique for its existence in natural and climatic conditions unfavorable for the growth of arboreal plants, the content of introduced species on artificial irrigation and their taxonomic richness. This is a well-preserved landscape object with more than 130 years of history, which occupies a worthy place in the landscape and architectural heritage of Ukraine. Among 19 domestic dendrological parks of national importance, “Askania-Nova” belongs to four with the highest indicators of dendroflora richness (from 1000 taxons and more) [2]. At the same time, the main part of the cultivated dendroflora of the

southern steppe region is preserved in our park that is the largest center for plant introduction here; of the modern diversity of its arboriflora, 565 taxons (454 species and 111 ornamental forms) are absent in all other green planting of the Northern Black Sea region [3].

The current collection pool of arboreal plants includes 766 species, 348 forms and varieties (1114 taxons) is belonging to 176 genera, 69 families, 40 orders, 5 classes, 2 divisions of higher plants [4]. Gymnosperms are represented by 72 species, 84 forms and cultivars (156 taxons); angiosperms, respectively, 694 species and 264 forms (958 taxons), 155 genera, 69 families. The collection pool of flowering and ornamental plants includes 700 taxons (397 species and 303 varieties) from 228 genera.

The priority areas of research activities in the dendropark include the preservation of rare plants ex situ. 225 species of introduced flora of the park have a zoological status: 151 are included in the IUCN Red List, 67 – European Red List, 6 – Berne Convention Lists, 3 – CITES Lists, 67 – Ukraine Red List, 11 – Kherson Oblast Red List. In the dendropark, the largest number of dendrozoexots (55.9% of species) is registered in the territories of the reserve parks of the Steppe of Ukraine is grown in comparison with other such objects; of the 12 species of age-old exotic ex situ presented in the collections of dendroparks of the steppe zone, 11 are in our park [5].

In recent years, the study of ecological and biological features and analysis of the results of the introduction in the southern steppe region of 60 plant species of the Red Book of Ukraine and 20 species with an international protected status have been carried out. The study of the morphobiological and ecological aspects of development, reproductive biology, the characteristics of spontaneous renewal, the life state in different growing conditions and the influence of various biotic and abiotic factors on it, methods of reproduction and long-term preservation in plant collections, as well as determining the spheres and methods of using to enrich the species diversity of culturphytocenoses and park construction was relevant for them, the optimal methods of their maintenance based on the results of studying the success of adaptation to the conditions of the southern steppe have been established.

An effective method for the protection and long-term preservation of rare species in the collection is the formation of their introduction populations in culturphytocenoses. Stable introduction populations of some studied species have been formed in the dendropark "Askania-Nova": *Allium ursinum* L., *Galanthus nivalis* L., *G. plicatus* M. Bieb., *Tulipa quercetorum* Klokov et Zoz,

Amygdalus ledebouriana L., *Cerasus klokovii* Sobko – in arboreal plantations and collection expositions with appropriate ecological and cenotic growing conditions; *Centaurea taliewii* Kleopow, *Crocus angustifolius* Weston, *Glaucium flavum* Crantz, *Paeonia tenuifolia*, *Tulipa scythica* Klokov et Zoz, *Viola alba* Besser – as a part of specialized collection of rare plants, phytocenoses of meadows and other open spaces.

The results obtained were used to optimize both park phytocenoses and natural ecosystems by repatriating of species lost or decreasing. Experience shows that more reliable and fast way to form populations is to use grown young plants or vegetative reproductive organs (bulbs or parts of the rhizome, root suckers). It is, in fact, determining for species that do not reproduce (or poorly reproduce) by self-seeding – *Galanthus nivalis*, *G. plicatus*, *Crocus angustifolius*, *Amygdalus ledebouriana*, *Cerasus klokovii*, *Spiraea polonica*; they are steadily renewed vegetatively in the park. It also creates good starting positions for many species, allowing them to settle quickly the living space. Subsequently, vegetative reproduction in them is supplemented by seeds (as in the case of *Allium ursinum*, *Centaurea taliewii*, *Glaucium flavum*, *Viola alba*). Seeds can be used to restore *Paeonia tenuifolia* populations, but initially by eliminating competition from mass species. In the future, it is able to give numerous viable self-seeding not only in its immediate environment, but also to integrate into existing plant communities. Repotting *Paeonia tenuifolia* plants obtained from seeds is not possible earlier than after 3 years. In the dendropark, the reproduction of planting material of this species in containers has been worked out, which expands the possibilities of its use.

In general, good results can be obtained in determining the optimal methods and the correct choice of places for the formation of new populations. For example, in the dendropark, the number of *Allium ursinum*, *Galanthus nivalis*, *G. plicatus*, *Paeonia tenuifolia* is growing rapidly, due to which now it is more than several thousand individuals of each species.

Therefore, the comprehensive study of plants of the zoological status of the national and world flora in the dendropark "Askania-Nova" made it possible to develop methods for their long-term keeping in collections, to determine the optimal methods of reproduction and to develop material for repatriation, if necessary, to natural conditions within their natural ranges.

LITERATURE

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