



*colloquium-journal*

*ISSN 2520-6990*

*Międzynarodowe czasopismo naukowe*

**Historical sciences  
Agricultural sciences**

**№12(99) 2021**

**Część 2**





*colloquium-journal*

ISSN 2520-6990

ISSN 2520-2480

Colloquium-journal №12 (99), 2021

Część 2

(Warszawa, Polska)

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Vinnytsia National Agrarian University.***Pantsyreva H.,***Candidate of Agricultural Sciences, Associate Professor,  
Vinnytsia National Agrarian University.*ORCID: <https://orcid.org/0000-0002-0539-5211>**Mazur K.***Candidate of Economics, Associate Professor,  
Vinnytsia National Agrarian University.*DOI: [10.24412/2520-6990-2021-1299-53-57](https://doi.org/10.24412/2520-6990-2021-1299-53-57)**FEATURES OF CULTIVATION AND USE OF SPECIES OF THE GENUS IRIS L. IN LANDSCAPING  
PODILLYA OF UKRAINE****Abstract.**

A promising task of green construction is to replenish the quantitative and species composition of ornamental plants in order to improve botanical gardens and parks, which are the key to modern urban landscaping. The current state of use of ornamental and valuable plants of the genus *Iris* L. in the Podillya zone to determine their prospects for landscaping the park zone of Vinnytsia National Agrarian University has been studied. Expansion of the collection of flowering plants in green construction due to the preservation of their gene pool will allow to study the selection of introduced species, varieties and hybrids adapted to the conditions of the growing area with the development of modern principles of their use in landscaping. According to the results of research of existing and introduced plants of *Iris* L. in Vinnytsia region, it is proposed to use in landscaping varieties and hybrids of these plants, which are characterized by high criteria for a set of morphological and economic-biological characteristics. The most promising varieties of foreign selection for the creation of the *Iris* L. collection on the basis of the architectural and exposition section of the Department of Forestry, Horticulture, Horticulture and Viticulture of the Faculty of Agronomy and Forestry have been studied. Summary of recommendations for the use of promising cultivars of foreign selection in green construction, taking into account their biological and ecological and morphological features. It is investigated that the study of varietal diversity of *Iris* L. allows to significantly expand the knowledge about their adaptive properties and use in different areas of floriculture in the Podillya area, as well as in selection work. It is determined that from the scientific and practical point of view the researched collection fund is perspective for creation of flower beds, borders, groups on a lawn background, mixborders and is an excellent material for creation of garden compositions. It is proved that the expansion of variants of modern decorative compositions with their participation will give the park zone of Vinnytsia NAU a more spectacular look.

**Keywords:** *Iris* L., variety, hybrid, landscaping, introduction, variants of use.

**Formulation of the problem.** Selection and introduction of new plant species into culture is an important task of modern botanical science, which can be solved through introduction. This allows you to enrich plant resources, improve the range of ornamental plants used in green building. Successful introduction of promising plant species into the culture is possible under the conditions of deep knowledge of the biology of their development, reproduction, as well as the study of the peculiarities of their cultivation and use.

Species of the genus *Iris* L. are promising for use in landscaping, and most of them have a high degree of decorativeness, even without breeding work, but in Ukraine they are not used enough in green building. In general, these are varieties and a small number of well-known species, while in nature there are many species, varying in color, shape and size of flowers, timing of flowering, and other decorative qualities.

In this regard, the study of species of the genus *Iris* in Podillya is a topical and promising issue.

**Analysis of recent research and publications.** In research institutions, botanical gardens, nurseries, biostations and expositions, the introduction of plants is combined with a system of integrated use of cultural

habitat through expanded reproduction outside the natural or cultural habitat and as an effective means of preserving their genetic cenoses and species populations. Therefore, the most important task of green building is to replenish the quantitative and species composition of ornamental plants in order to improve botanical gardens and parks, which are the key to modern urban landscaping. Today, these scientific studies are relevant and due to the need to introduce new and uncommon species and varieties, hybrids of flower crops in order to enrich the cultural biodiversity of a particular natural and historical area with promising species, varieties and forms. Flower species of natural flora are selected from collection funds and are characterized by high decorative value in combination with economic feasibility for their introduction into industrial culture in the natural and climatic conditions of the Podillya zone. Species of the genus *Iris* are promising flowering and deciduous ornamental plants. This genus has a number of positive features: high decorative value, significant species and varietal diversity in shape, size and color of the flower. Roosters are undemanding to soils, light-loving, although they grow well in slightly shaded areas, do not like too humid places, quite drought-resistant.

**Presenting main material.** Studies of biological features of species of the genus *Iris* L. (*I. Pumila*, *I. orientalis*, *I. hungarica*, *I. ensata*, *I. japonica*, *I. musulmanica*) were conducted on the basis of the biostationary of VNAU during 2018–2020. The research was carried out by transferring live plants from nature and various botanical gardens, arboretums and private collections. Plant care was carried out in accordance with the agronomic requirements of the species on the basis of generally accepted methods. Plants were grown with minimal use of agricultural techniques, namely, weeding and watering.

The purpose of the work is to study the peculiarities of cultivation and reproduction of species of the genus *Iris* L. and variants of use in landscaping of the Podillya zone.

**Results.** In studying the biological features of species of the genus *Iris*, special attention was paid to the study of ontomorphogenesis of these species, as data on the peculiarities of individual development of species of roosters belonging to different subgenera were not available in the literature in Podillya. The analysis of literature data on these issues for other regions showed that in most works the main attention is paid to the early stages of the ontogenetic cycle or ontomorphogenesis of only some species (Table 1).

Table 1

**Morphometric features of species of the genus *Iris* in the generative state (1st year)**

| Species               | Leaf length, cm | Leaf width, cm | The height of the flower-nose, cm | Number of flower noses, pcs. | Number of flowers, pcs. | Flower diameter, cm |
|-----------------------|-----------------|----------------|-----------------------------------|------------------------------|-------------------------|---------------------|
| <i>I. musulmanica</i> | 62,5±5,1        | 1,3±0,1        | 67,5±5,5                          | 2–3                          | 3–4                     | 6,5±0,5             |
| <i>I. orientalis</i>  | 45,0±3,7        | 0,9±0,07       | 49,5±4,0                          | 2–3                          | 2–3                     | 5,5±0,4             |
| <i>I. ensata</i>      | 55,1±4,5        | 0,9±0,07       | 47,5±3,9                          | 1–2                          | 1–2                     | 6,5±0,5             |
| <i>I. hungarica</i>   | 22,5±1,8        | 1,3±0,1        | 26,5±2,2                          | 3–4                          | 2–3                     | 5,5±0,4             |
| <i>I. pumila</i>      | 8,9±0,7         | 0,7±0,06       | 2,5±0,2                           | 2–3                          | 1                       | 6,0±0,5             |
| <i>I. japonica</i>    | 42,5±3,5        | 3,5±0,3        | 32,5±2,7                          | 1–2                          | 1–2                     | 4,1±0,3             |

According to the morphometric characteristics of the species, it was determined that the largest number of peduncles form *I. hungarica* (3-4), *I. musulmanica* (2-3), *I. orientalis* (2-3), and the smallest *I. ensata* (1-2), *I. japonica* (1-2), *I. pumila* (2-3). The beginning and duration of flowering, as can be seen from the table, change annually and depend on weather and climatic

conditions not only this year but also last year, because roosters overwinter with the formed flower buds. Almost all species of the collection are characterized by annual flowering and fruiting, except for *I. ensata*. In 2018, there were no generative shoots on individual individuals of *I. hungarica*. Plants *I. japonica*, do not bear fruit regularly.

Table 2

**Terms and duration of flowering species of the genus *Iris* in the botanical garden «Podillya» VNAU**

| Species               | Budding     | The beginning of flowering | End of flowering | Total duration of flowering, days |
|-----------------------|-------------|----------------------------|------------------|-----------------------------------|
| <i>I. musulmanica</i> | 27.05–01.06 | 01.06–08.06                | 13.06–18.06      | 10–13                             |
| <i>I. orientalis</i>  | 08.06–10.06 | 12.06–15.06                | 22.06–30.06      | 10–15                             |
| <i>I. ensata</i>      | 10.06–12.06 | 15.06–18.06                | 02.07            | 14–17                             |
| <i>I. hungarica</i>   | 07.05–15.05 | 12.05–23.05                | 18.05–02.06      | 6–10                              |
| <i>I. pumila</i>      | 18.04–25.04 | 22.04–28.04                | 04.05–11.05      | 12–15                             |
| <i>I. japonica</i>    | 20.05–25.05 | 25.05–29.05                | 13.06–17.06      | 16–20                             |

According to the table, *I. pumila*, *I. hungarica* (late April – early May) differ in early flowering. Relatively late bloom *I. orientalis*, *I. ensata* (bloom until July). Thus, with the help of a group of studied roosters, you

can ensure continuous flowering from late April to July (Fig. 1). The shortest flowering is characteristic for *I. sintenisii* (8-9 days) *I. Hungarian*.

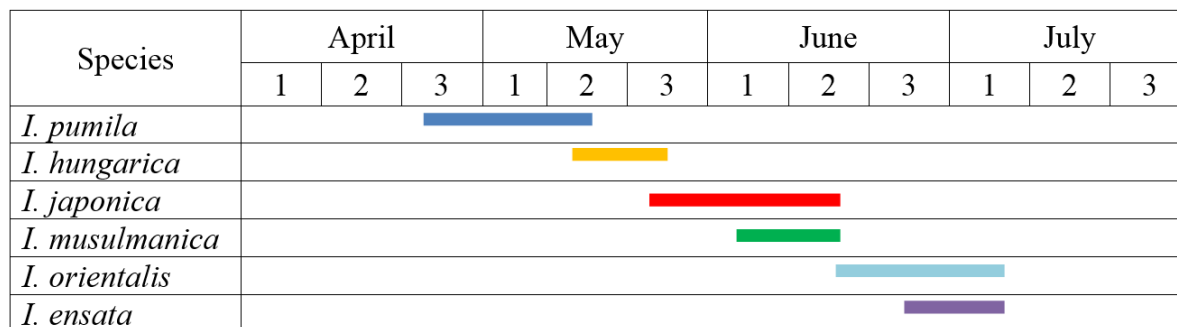


Fig. 1. The spectrum of flowering roosters in the biostationary of VNAU

The nature and lifespan of the flower of the studied species were studied by visual observation, and also used the recommendations of A.N. Ponomareva. The lifespan of one flower in species of different subgenera is on average 4-6 days (from bud color to flower wilting). The course of flowering roosters during the day is the same in all species and they belong to the group of species with the morning type of flower opening. The maximum number of flowers is revealed in the conditions of the biostationary of VNAU between 8 and 11 o'clock, but under adverse weather conditions the intensity of flowering changes, which indicates the adaptive nature of flowering roosters. The flowers close at night, in the rain or in cloudy weather almost do not open. According to some authors, this is a device to protect against moisture or the negative effects of high humidity. Duration of flowering, according to GI Rodionenko depends on temperature and humidity. The higher the temperature and lower the humidity, the shorter the flowering period. Thus, in rainy or cool weather, the duration of flowering of a single flower is extended by 1-2 days. The flower of the species of the genus *Iris* has a simple corolla-shaped perianth, consisting of six

lobes or leaves, which are arranged in two circles (three outer bent down and three inner are in the upper tier, forming a domed structure). The narrowed lower part of each particle is called the nail, and the expanded part is called the plate. All perianth particles grow at the base and form a tube of different lengths. Parts of the perianth perform a signal, protective function, and also play the role of a landing site for insects.

Table 3 presents possible uses of the studied species. High-stemmed species are present in our collection, deserve attention and can be used in park compositions due to their beautiful leaves, high drought resistance, ability to grow on compacted soil (*I. musulmanica*, *I. orientalis*). They can plant entire arrays.

When planting species of the genus *Iris* in groups, you can combine them, combining blue-violet, golden-yellow and light purple colors. The original composition can be made in a contrasting combination of rooster species with plants such as *Aubrieta deltoidea* D.S., *Arabis alpina* L., *Iberis sempervirens* L. (snow-white). It is recommended to plant compositions of blue-violet roosters together with daylilies.

Table 3

Use of the studied species of the genus *Iris*

| Species               | Options for use |                |           |                     |       |                  |                                |     |
|-----------------------|-----------------|----------------|-----------|---------------------|-------|------------------|--------------------------------|-----|
|                       | tapeworms       | group landings | rockeries | borders, mixborders | curbs | decorating ponds | medicinal, economic properties | cut |
| <i>I. musulmanica</i> | +               | +              | -         | +                   | -     | +                | -                              | +   |
| <i>I. orientalis</i>  | +               | +              | -         | +                   | -     | -                | -                              | +   |
| <i>I. ensata</i>      | +               | +              | -         | +                   | -     | +                | +                              | +   |
| <i>I. pumila</i>      | -               | +              | +         | +                   | +     | -                | -                              | -   |
| <i>I. hungarica</i>   | +               | +              | +         | +                   | +     | -                | +                              | -   |
| <i>I. japonica</i>    | -               | +              | -         | +                   | -     | +                | -                              | -   |

The background for such compositions is a park-type lawn. The leaves of roosters remain green until late autumn, so they are planted before those perennials that lose their decorativeness in the second half of summer. A bright effect in this period can be achieved by planting them with gladiolus, the leaves of which resemble iris leaves.

Solitary plantings of roosters look good against the background of beautiful flowering shrubs: *Spiraea Wanhouttei* Zab. (*Spiraea Wanhouttei* Zab.) – a combination of white and blue or purple species of roosters (*I. hungarica*, *I. musulmanica*), *Weigela* (*Weigela floribunda* CA Mey) – red-pink shades, the action of *Lemoine* (*Deutzia Lemoinei*), Crimean tamarisk (*Tamarix tetrandra* Pall.), different colors of lilac with species and varieties of yellow roosters. In the first case, the flowers of roosters soften the saturation of the dense white mass of spirea flowers, which makes the composition exquisite. *Weigela* multi-flowered with a dense flower mass in combination with blue Siberian roosters will have the same effect. The composition with tamarisk and violet-blue shades of roosters looks good. Around – a park lawn and wood.

Based on the results of studying the biological characteristics of species of the genus *Iris*, the prospects of wide use of the studied species in floriculture and green building are proved. Promising for landscaping studied plants of the genus (species and varieties) are planted in the expositions of the botanical garden «Podillya» VNAU.

**Conclusions.** It is established that *I. pumila*, *I. hungarica* (end of April – beginning of May) differ in early flowering. *I. orientalis* and *I. ensata* bloom relatively late (bloom until July). Thus, with the help of a group of studied roosters, you can ensure continuous flowering from late April to July. It was found that the total duration of flowering in the studied species was observed from 6-10 days in *I. hungarica*, to 16-20 days in *I. japonica* with the maximum number of flowers on the peduncle from 1 pc. in *I. pumila*, up to 3-4 pcs. in *I. musulmanica*. Due to the variety of colors, different flowering periods, ecological diversity, the studied species are quite valuable plants for landscaping: group and solitary plantings, flowerbeds, mixborders, borders, in rosaries, to create Japanese gardens, ponds and monosad. The created collection of species and varie-

ties of irises can be used for further study of their biological features, reproduction and wide use in landscaping and partly as a gene pool of species in need of protection. Rare, in particular, endemic species bloom profusely and bear fruit, which is the basis for their possible use to restore natural populations.

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