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RANGE ENRICHMENT OF DECORATIVE CARNATION WITH TYPES OF NATURAL FLORA

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The results of the initial introduction of 6 kinds of decorative carnation of natural flora from different regions were introduced in the Botanical garden of Ivan Franko Lviv National University. Decorative qualities of given plants and their compliance with requirements necessary for widespread implementation in landscaping were confirmed.

Keywords: types of Dianthus L., biological characteristics, reproductive ability, decorative features, introduction.

Selection of ornamental plants for the purpose of floriculture is expanding during the process of introduction; one of its sources is natural flora of different regions. Promising in this respect is the genus of *Dianthus* L. belonging to the family *Caryophyllaceae*, which includes about 300 species that grow naturally in Europe, Asia, tropical and South Africa [8]. Analysis of the research and prospects for the introduction of the genus *Dianthus* indicates that there is potential for the use of native species of carnations in floriculture of Western Ukraine. Individual reports on biological characteristics, elements of ontogeny, methods of cultivation, methods of reproduction, use in landscaping are found in works devoted to the introduction of ornamental plants [2,3].

Since 2000 the Botanical garden of Ivan Franko Lviv National University (hereinafter - the Botanical garden) has been working on the initial testing and selection of decorative of carnations belonging to natural flora. Their introduction will allow expanding species composition of ornamental plants and enrich cultivated flora of Ukraine. The aim of the research was to determine the biological characteristics and reproductive abilities of carnations which will assess the possibility of giving them the status of ornamental perennials.

Material and Methods of Research

Objects of study are six types of carnations that grow in the collection named "Unextended ornamental perennials" of the Botanical garden. Two species are floral elements of Ukraine, four of the species belong to foreign floras. Natural species of Ukraine are: *Dianthus deltoides* L. (deltoid carnation) which is increasing in most of the country except the southern steppe regions and Crimea, meadows, forest outskirts and *Dianthus gratianopolitanus* Vill. (Grenoble carnation) - a sozofit listed in the Red Book of Ukraine with the status "missing in nature". [7] Other carnations are European species: *Dianthus arenarius* L. (sandy carnation) growing in sandy meadows and pine forests of Middle and Western Europe, pre-Caucasus; *Dianthus cruentus* Griseb. (bright red carnation) is growing in the mountains of Greece; *Dianthus hungaricus* Pers. (hungarian carnation) is growing in the Czech Carpathians; *Dianthus knappii* (Pant.) Aschers et Kanitz ex Borb. (Knapp's carnation) is growing on sandy soils of Western Balkans [6]. *D. gratianopolitanus* and *D. knappii* are rare plants of the European Red List . [9] Plants introduced from seeds obtained from botanical gardens of Europe. The carnations seeds of Botanical garden reproduction were used in experiments.

Phenological observations were carried out by the method of Main Botanical garden of Russian Academy of Sciences [4], fenorythmotypes were determined according to I. Borisov [1]. According to conventional methods for botanical gardens features of reproductive biology were studied [5].

The research results

Explorating the prospects of introduced plants for landscaping needs is based primarily on the study of morphological and biological characteristics in terms of conservation of introduced species in new decorative soil and climatic conditions. Carnation types in terms of cultivation are herbal policarps and heliophites. They belong to the plants with long vegetation phenorythm type; they remain green in summer and winter. *D. arenarius* creates turf. Its stems are simple or with branches. The plant's height is 15-25 cm with numerous leaves, linear or lanceolate, green. Flowers are separate, white, with a diameter of 2 cm, appear in May. *D. cruentus* also

forms a more or less dense turf. Stems are green, rectangular, up to 60 cm. Leaves are linear, 2-3 mm wide, pointed. Bright red flowers with diameter of 5-6 mm are assembled by 8-9 in a corymbose inflorescence. They blossom in July – August and fruit in late August - September. Creeping shoots of *D. deltoides* are well rooted throughout the season. Stems are branchlike, 15-20 cm tall. Leaves are linear or linear- lanceolate, dark green. The flowers are bright pink, placed by 2-3 on the ends of the shoots. They blossom in late May and fruit in June and July. Stems of *D. gratianopolitanus* are lignified at the base. The plant's height is 30 cm, covered with a bluish bloom. The leaves are numerous, narrow linear, blunt, gray-green. Pink or red flowers are solitary or collected by 2-3 in inflorescence. Budding begins on the first week of May. Mass blossoming begins in the beginning of June, the blossoming stage lasts 30 - 35 days. The plants fruit in July. Leaves of *D. hungaricus* are of warm grey waxy coating. White fragrant flowers are solitary or 2-3 on high stalks. It flowers in May and June for 30-35 days and gives plenty fruits in July. *D. knappii* has tall flowering stems up to 40 cm in height. The leaves are 2-4 mm wide. The flowers are yellow, 7 mm in diameter, collected in inflorescence of 4-6. The plant blossoms in June.

Reliable indicator of the successful introduction in the new environment is a high reproductive capacity of plants. To assess the reproductive success of carnations seed productivity, sustainability and quality of sowing seeds, the possibility of overcoming calm during storage were studied . We determined the potential (PSP) and actual (ASP) seed productivity , seed productivity ratio (CPR) and the weight of 1000 seeds of *Dianthus* species (Table 1).

The PSP range of *Dianthus* species is wide - from 56 to 473 of seed primordia on the generative shoot and implemented in ASP by 29 seeds in *D. hungaricus* to 356 seeds in *D. cruentus*. CPR ranged from 31.3 % in *D. deltoides* to 81.4 % in *D. gratianopolitanus,* indicating a successful adaptation to new types of edaphological climatic conditions.

1. Seed productivity indicators of *Dianthus* species in a culture (average to generative shoot , 2005-2010)

Species	PSP, pcs. seeds.	ASP, pcs. seeds.	CPR, %	Weight 1000 seeds, gram
D. arenarius	182	105	57,7	1,1
D. cruentus	473	356	75,3	0,8
D. deltoides	194	62	31,3	0,3
D. gratianopolitanus	113	92	81,4	0,9
D. hungaricus	56	29	52,7	1,4
D. knappii	58	35	60,3	0,5

Laboratory germination of freshly harvested seeds of most species was high, decreasing slightly during the first year of life (Table 2). During the second year of storage germination gradually decreased and it was better shown with D. arenarius and D. Knappii, respectively to 19.3 % and 13.4%.

2. Dynamics of laboratory germination of seeds of Dianthus species,%

Type	Laboratory germination during storage, years				
	freshly collected	0,5	1	1,5	2
D. arenarius	87,7	90,0	75,3	71,3	19,3
D. cruentus	88,0	80,0	75,3	70,4	62,1
D. deltoides	97,2	95,6	93,2	94,4	60,7
D. gratianopolitanus	88,0	88,0	82,0	50,7	48,0
D. hungaricus	87,7	84,6	83,3	76,7	63,5
D. knappii	51,0	31,3	17,3	15,2	13,4

The investigated carnations can be propagated vegetatively by turf division and cutting of non-blossoming shoots in spring or after blossoming. Species are winter -, frost- and drought-resistant, requiring simple conditions for growth. Plants need drained soil suitable for open sunny areas, but cannot tolerate wet winters. Decorative during the year, carnations can be used for landscaping rock gardens, rocky gardens,

rockeries, etc. Decorativeness is enhanced in the group stands of large number of individuals.

Conclusions

1. Studied species of carnations had initial introduction tests and can be positively evaluated by performance, decorative household and biological properties as well adapted to the edaphological climatic conditions of Western Ukraine.
2. Studied plants are promising for the introduction and cultivation, they are in full development life cycle, well reproduce by seeds and vegetatively, normally survive the winter.
3. Introduced carnations can complement the species composition of the cultivated flora of Ukraine as ornamental perennials and deserve wide implementation in an industrial culture and floriculture.

References

1. Борисова И. В. Сезонная динамика растительного сообщества // Полевая геоботаніка – Ленинград: Наука, 1972. – С. 5 - 94.
2. Декоративные растения открытого и закрытого грунта. – К.: Наукова Думка, 1985. – 669 с.
3. Декоративные травянистые растения культурной флоры Беларуси / Н. М. Лунина, И. К. Володько, В. В. Гайшун [и др.]. – Минск: Беларус. Навука, 2010. – 170 с.
4. Методика фенологических наблюдений в ботанических садах СССР. – Москва: ГБС АН СССР, 1975. – 27 с.
5. Методические указания по семеноведению интродуцентов. – Москва: ГБС АН СССР, 1980. – 64 с.
6. Полетико О. М., Мишенкова А. П. Декоративные травянистые растения открытого грунта. – Ленинград: Наука, 1967. – 208 с.
7. Червона книга України. Рослинний світ / за ред. Я. П. Дідуха. – К.: Глобалконсалтинг, 2009. – 912 с.
8. Ширева Л. К. Интродукция парковых многолетников в Молдавии. – Кишинев.: Штиинца, 1986. – 116 с.

9. European Red List of Globally Treatened. Animals and Plants. United Nations. New York, 1991. – 154 pp.