

**CLIMATIC PRECONDITIONS AND SPECIFICITY OF  
INTRODUCTIONS FOR PROMISING GRAPE VINE CULTIVARS  
IN REPUBLIC OF BELARUS**

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**Introduction**

Viticulture in the Republic of Belarus (RB) is now in its infancy, hereupon proper *Vitis* selection work still not developing. Practically all grape wine cultivars are foreign or in process of introduction, that implicate preliminary studies of varietal characteristics in planted collections & nurseries of *Vitis sp.* The acclimatization advances for assortment (diversification) depends on degrees of alien crops ecological plasticity and their positive reactions in response to growing technologies. Scientific foundations for grape wine introduction with regard to different climatic zones were developed by A.M. Negrul (1938–1965) [1]. The viticulture possibility is stipulated by sum of active temperatures (SAT) and duration of vegetation period.

**Material and methods**

Council of Ministers of the Republic of Belarus from 31.12.2010 No1926 “On State Integrated Programme for Development of potato, vegetable and fruit growing in 2011–2015” (Council of Ministers release from 22.12.2012 No1193).

**Results and discussions**

Grape wine propagation in RB proceeds due to implication of climate. On the global warming background Belarus experiences the gradual widening of northern *Vitis* frontier and also boundaries of other heat-lovers (soya, maize, walnut, apricot) – that was the problem several decades ago. RB situated between 56° & 51° of northern latitude, including three main agroclimatic zones (AZ). According to academician V.F. Loginov [2], the borders of south- & central- AZ changed (150 km northward). Along with SAT, the frost-free period increased

for 12÷18 days. The vegetation of plants reaches 120÷145 days. The insolation augments from 3500 MJ/m<sup>2</sup> (RB north) to 4100 MJ/m<sup>2</sup> (RB south). Belarus territory is considered as area of *risk farming* and pertains to 5-th climatic winter hardiness zone – WHZ 5, *T* from -23.3°C to -28.9°C (Heinze and Schreiber, 1984). Note should be taken – Northern viticulture gives some advantages. So, more durable winter period with low temperature in RB prevents development of quarantine grape pest phylloxera (*Viteus vitifolii*). In addition several hazardous grape diseases (grapevine fanleaf virus, grapevine yellow mosaic *virus*) are absent in Belarus. The grape fungal infections (powdery mildew, oidium, gray mold) are less aggressive due to moderate temperatures of *Vitis* vegetation period. Thus number of pesticide treatments are not needed or reduced to prophylaxis.

#### Conclusions

The *Vitis* cultivars (*cvs*) of Russian (*Krasa severa*, *Cosmonaut*, *Cosmos*, *Agat donskoi*), and Baltic (*Zilga*, *Supaga*) selection are already zoned (regionalized) in RB. The *cvs*: *Bianca*, *Kristall*, *Platovskij*, *Augusta*, *Regent*, also hardy *cvs*: (*S 675*, *Maréchal Foch* – neukryvnyh) are now on-stream in the state variety trials because they are worth-while for local viticulture –disease resistant endowed with biological plasticity. New complex-resistant varieties of grapes were created during last decades using the some Franco-American *cvs* crossed with *V. vinifera*. These interspecies hybrids are next best (compared with traditional European that one's). The reliable hardy *cvs* of American selection (e.g. *Adalmina*, *Prairie Star* etc.) correspond most valuable for Belarus, as well breeding new items: *Briana*, *Marquette*, *Frontenac Gris*, *Somerset Seedless* [3]. All of them characterized by high resistance to cold and can be grown in RB without winter shelter (at minimal needed pesticides treatment) – excellent opportunity for development in Belarus the organic (ecological-friendly) viticulture.

#### Bibliography

1. Negrul, A.M. *Terrain and grape cultivars matching for vineyard* / A. M. A.M. Negrul, A.K. Krylatov. – Moscow: Kolos, 1964. – 217 p.
2. Loginov, V.F. *Global and regional climate changes и региональные изменения климата: Causes and consequences* / V.F. Loginov. – Minsk: TetraSystems, 2008 – 496 p.
3. Oleshuk, E.N. *Zoned and perspective grape cultivars for Belarus* / E.N. Oleshuk, E.H. Popoff // NSH J. Agronomy (Minsk). – 2013. – № 15 (71). – P. 84–90.

## RARE SPECIES OF THE GENUS *PAEONIA* L. UNDER INTRODUCTION IN BASHKORTOSTAN

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#### Introduction

Peonies have appeared on our planet as scientists assume, during the cretaceous period. In A.L.Tahtadzhana's opinion (1980) is an ancient deadlock

branch of evolution with the extremely imperfect device of reproduction (slow development seedlings, long formation of kidneys of renewal, absence of annual forms). Therefore peonies demand careful studying and protection. Till our time family Paeoniaceae was kept as monotypic with the only genus *Paeonia*.

The majority of peonies have food and decorative value, are good bee plants. But they represent the greatest interest as the herbs including in official medical practice. The growing requirement for raw material cannot be satisfied only with resources of natural flora. With the purpose of preservation of a gene pool of rare species of a peony and creation of additional sources of medicinal raw material it is carried out introduction studying of their biological features for introduction to culture and creation of artificial plantations in a forest-steppe zone of Bashkortostan.

#### **Material and methods**

As objects of researches 4 species of a peony of a collection of Botanical garden - institute of the Ufa center of science of the RAS are used: *Paeonia anomala* L. - it is included in the Red book of Republic Bashkortostan (2001), it is related to a category 1 - a kind which is taking place under threat of disappearance; *P. hybrida* Pall. – endemic of Altai, recently found out in territory Republic of Bashkortostan, it is offered for inclusion in the Red book of the Russian Federation; *P. tenuifolia* L. - it is included in the Red book of the USSR (1984); *P. wittmanniana* Hartwiss ex Lindl. - endemic of Caucasus, it is included in the Red book of the USSR (1984).

Studies were carried out on plots of the collection section peonies laboratory of introduction and selection of flower plants Botanical Garden-Institute, Ufa Science. Agricultural activities include weeding, hoeing, watering as needed.

Study of decorative and economically useful features carried out in the open ground on the “Methodology state strain testing decorative cultures” (1960). Study of the seasonal rhythm of plants was carried out according to the standard procedure in the botanical gardens of phenological observations (1972). Seed production was calculated by the method of I.V. Vaynagy (1974).

#### **Results and discussions**

On the basis of Botanical garden - institute in 2011-2013 are created queen cell and seed plantations of the given specific peonies. Works on them introduction to studying are started. It is shown, that in conditions of culture *P. anomala*, *P. hybrida*, *P. tenuifolia*, *P. wittmanniana* are characterized by high stability, surpass wild-growing individuals on the majority morphometrical parameters and seed efficiency. Besides *P. anomala* and *P. tenuifolia* are capable to self-moving by seeds.

In 2011, the first results were obtained. The field seed germination *P. anomala* reached - 38%, *P. hybrida* - 47%, i.e. was sufficiently high.

In spring 2012, in *P. anomala* rose further 15 - 23% of the seeds, in *P. hybrida* new shoots were observed. Thus, the period of seed germination depends on the specific features of peons.

It is revealed positive exogenous influence of synthetic regulators of growth (heteroauxin, kresacin, TD-2, TD-5) on intensity of germination of seeds *P. anomala* (increase of germination in 1.3-1.6 times). Recommendations on use physiological active substance in field conditions are developed.

**Conclusions**

The received results will allow solving successfully a problem of preservation of rare and valuable genotypes of a peony in conditions of culture, to expand a raw-material base, to reduce terms of reception of a mass landing material, and also to reveal alternative sources of medicinal raw material.