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FEATURES OF FLOWERING SPECIES OF HE GENUS VIBURNUM L. UNDER FOREST-STEPPE OF UKRAINE

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Dynamics and intensity of flowering is investigated, the calendar of flowering of Viburnum L. species in introduction conditions is made. Phenological groups are allocated depending on terms of the beginning of flowering: early flowering, middling flowering, later flowering. Features of anthers' dehiscence some Viburnum L. species are considered.

Flowering, Viburnum, introduction, growth, development

Today there is an urgent need for original plants to create gardens and park facilities. Promising in this respect are flowering woody plants that make up the large group of many families, that among these are most decorative variety of plants. In particular, the representatives of the family *Viburnaceae* Dumort., which will be discussed in this paper. The use of plants for the purposes of landscape gardening is an excellent means to an expressive garden and park art.

The purpose of the study - to analyze the peculiarities flowering, and the structure of the flowers of 11 species and 5 cultivars viburnums under Forest- Steppes of Ukraine.

Materials and Methods study. The observations were carried out in 2000-2006, in the National Botanical Garden. MM Grishko National Academy of Sciences of Ukraine, Botanical Garden. A. Fomin Kyiv National University. T. Shevchenko, Kyiv in urban plantings, White Church, Uman, Vinnytsia, Cherkasy. investigated plants belonging to the 3 of 9 selected in the genus Viburnum sections: *Lantana* Spach. (*V. lantana* L., *V.l. 'Aureum', V.l. 'Variegatum' V. carlesii* Hemsl., *V. rhytidophyllum* Hemsl., *V. veitchii* C.H. Wright, *V. burejaeticum* Rgl. et Herd., *V. buddleifolium* C.H. Wright), *Lentago* DC. (*V. lentago* L., *V. prunifolium* L., *V. rufidulum* Raf.), *Opulus* DC. (*V. opulus* L., *V.op. 'Roseum', V.op. 'Nanum'V. sargentii* Koehne, *V. s. ' Flavum'*).

The intensity of flowering viburnums was determined by the method of V. Capper [1] in the modification ME Bulygin [2], a profusion of flowering - on a scale of AA Korchagin [3], phenological observations were carried out by "Metodykoy phenological

observations in the Botanical Gardens USSR" [4], statistical analysis of data was performed by methods G.N. Zaitsev [5, 6].

Results. We investigated the dynamics and intensity of flowering viburnum, compiled a calendar of blooms. Such data, especially for flowering plants needed to create full compositions in gardening in the first place - the gardens of continuous bloom.

Viburnums have white flowers, sometimes yellowish (*Viburnum rhytidophyllum*), or outside pink (*Viburnum carlesii*), not fragrant. The only exception is *Viburnum carlesii*, flowers which are very fragrant. The inflorescence of viburnums are of two types:

1) Flower panicles collected in hemispherical plate (external to the inflorescence - large, white corolla rotate, and without pistillate without staminate that is sterile - attract insects inside - in central inflorescence with tubular- campanulate green corolla, stamens, pistillate, fertile, with nectar. These buds are characteristic of species used Opulus: *V.opulus, V.sargentii, V.trilobum*. Sterile flower blossom still fertile and bloom later. The inflorescence *V.op. 'Roseum'* consisting only of sterile flowers, gathered in globular inflorescence 10 - 15 cm in diameter.

2) Inflorescence composed of small pistillate-staminate flowers. These inflorescences are typical for other viburnums.

For exotic species introduction in the generative phase is one of the most important criteria for evaluating the success of their introduction. ge of entry of plants in the generative phase varies significantly and depends on several factors, most of which are biological characteristics of the species, as well as light, moisture, nutrient availability etc.

We found that the seed breeding species *Viburnaceae* age of transition to the generative stage of ontogeny varies from 5 - 6 years (*V.lantana, V.opulus, V.sargentii, V.burejaeticum*) to 8 - 10 (*V.prunifolium, V.lentago*). In most cases, associated with the first flowering and first fruiting or gap between stages 1 - 2 years. In vegetatively propagated plants first flowering occurs: at the age of 1 year - V.*opulus 'Roseum',* 2 years - *V.opulus, V.sargentii,* 3 years - *V.rhytidophyllum, V.buddleifolium,* 4 years - *V.burejaeticum* .

According to the literature the first flowering *Viburnum opulus 'Nanum'* going for 8 year. The literature shows the abundant [8] and small [9] of flowering cultivars. According to our information, he observed a slight bloom.

A Zhamba [10] studied the morphogenesis viburnum flowers during the growing season. The feature of all studied species of viburnum is the formation of a modified deepening axle receptacle on the edge of which the elements are laid flowers before the formation of its parts.

Buds of viburnum for the formation of embryonic organs can be divided into two groups:

I - Viburnum buds *V. lantana, V.burejaeticum, V. rhytidophyllum, V. buddleifolium, V. carlesii* processes of differentiation which occurs in one growing season. Thesese species of time to lay all the organs of the flower and winter in the V phase of organogenesis.

II - buds *Viburnum opulus, V. rufidulum, V. sargentii, V. lentago, V. prunifolium,* differentiation processes which occur within two growing seasons, causing the buds to some phase of flowers go dormant.

The development of the generative organs *Viburnum opulus* stops in the current growing season to IV phase of organogenesis. In the buds have time to bet only sepals, petals and anthers.

The main flowering plants phenophase be considered the beginning of flowering [7]. We selected phenological groups depending on the timing of the beginning of flowering. The group of plants that bloom early included: *V.carlesii* (20.04), *Viburnum burejaeticum* (22.04), *V.veitchii* (22.04), *V.lantana 'Variegatum'* (25.04); late bloom - *V.rufidulum* (15.05), *V.opulus 'Nanum'* (15.05), *V.lentago* (21.05).M ost studies of species and cultivars of viburnum belongs to the average duration of flowering (Table).

Duration of flowering depends primarily on the biological characteristics of the species, age of the plants and slightly on temperature conditions. But the sudden change in temperature during flowering decreases the duration by 2 - 3 days. The longest blooming *V.opulus 'Roseum', V.sargentii* (27 days), *V.opulus, V.prunifolium* (for 22 days).The minimum period of flowering have *V.lentago, V.lantana, V.burejaeticum, V.buddleifolium* (12 - 14 days).

The calendar of flowering species *Viburnum* L.

Species, cultivar	Dates of beginning of flowering			The average duration of flowering, days	The duration of decorative phase days	Intensity of flowering, ball
	average	the earliest	Latest			
Viburnum opulus	9.05	6.05	15.05	22	17	5
V.op. 'Roseum'	5.05	4.05	10.05	27	23	5
V.op. 'Nanum'	15.05	12.05	20.05	17	14	1
V. lantana	27.04	22.04	28.04	14	10	5
V.l. 'Aureum'	27.04	25.04	29.04	20	15	5
V.l. 'Variegatum'	25.04	21.04	28.04	19	14	5
V.carlesii	20.04	16.04	24.04	20	14	5
V.rhytidophyllum	30.04	25.04	1.05	16	12	5
V. lentago	22.05	18.05	24.05	13	10	5
V.rufidulum	15.05	12.05	16.05	16	12	5
V.prunifolium	7.05	5.05	8.05	22	18	5
V. veitchii	22.04	18.05	24.05	20	15	5
V.burejaeticum	22.04	18.05	24.05	14	10	5
V.buddleifolium	8.05	6.05	8.05	14	10	5
V.sargentii	9.05	7.05	10.05	27	23	5
V.s.'Flavum'	2.05	30.04	3.05	18	14	5

Exploring flowering species of viburnum, we paid attention to the process of opening of anthers. Established that disclosure of the buds begin deflection one lobe, located on the south side. After folding petals on bended knee corresponding Filaments appear anthers. They become vertical, slightly declined position, their elongated axis oriented north-south; 1 second vertical position they occupy and their axis directed from east to west.

Thereafter, the anthers appear on the east south and west sides. Latest anthers appear on the north side of the flower.

2 minutes from the beginning of observation anthers on the south side of the flower, crack or shrink and pollen comes out, after 4 seconds simultaneously crack anthers from the southeast, east and west sides of the flower and become spherical, the surface of which is yellowish pollen. Last for 30 minutes, later than anthers south orientation (exposure), crack anthers the north side.

Cracking anthers in *V. lantana* lasts 38 min., Pollen emptied within 7 hours and 30 minutes, the process of opening buds beginning to the pollen rash lasts 1 hour. 10 minutes.

As *V. opulus* anthers crack 45 min., *Viburnum prunifolium* - 1 hour., *V. sargentii* - 50 min., *V. carlesii* - 30 min. Emptied pollen in the *V. opulus* for 6 h., *V. prunifolium* - 6 hrs., *V. sargentii* - 6 hours. 30 minutes., *V. carlesii* - 7 hours. The process of opening buds beginning to the pollen rash continued to V. *carlesii* 1 hr., *V. opulus* - 1 hour. 30 minutes., *Viburnum sargentii* and *V. prunifolium* - 2 hours.

At *viburnum sargentii*, unlike other species of filaments form two knee. At pollination the first lap rectified, and the second is the end of life of a flower in a bent position. On this basis it is easy to distinguish it from flower flowers *Viburnum opulus*, are very similar.

In foreign countries the past few decades has changed the look of planting sites due to diversification of ornamental plants. A similar trend is observed in the country. By creating an appropriate framework to mobilize and breeding ornamental woody plants should be used to optimize the parks and other landscapes like those just created, and those reconstructed, making it possible to achieve the best decorative effect, and representatives of the family Viburnaceae quite suitable for this purpose.

Conclusions. Thus, we investigated the dynamics and intensity of flowering viburnum, compiled a calendar of blooms. Depending on the timing of the beginning of flowering phenology color groups: plants that bloom early bloom late and middle periods of flowering.

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ОСОБЕННОСТИ ЦВЕТЕНИЯ ВИДОВ РОДА VIBURNUM L. В УСЛОВИЯХ ЛЕСОСТЕПИ УКРАИНЫ

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Изучена динамика и интенсивность цветения, составлен календарь цветения калин в условиях Лесостепи Украины. В зависимости от сроков начала цветения выделены фенологические группы: раннезацветающие, среднезацветающие, позднезацветающие. Рассмотрены особенности процесса раскрывания пыльников некоторых калин.
Ключевые слова: *цветение, Viburnum, интродукция, рост, развитие*

ОСОБЛИВОСТІ ЦВІТІННЯ ВИДІВ РОДУ *VIBURNUM* L. В УМОВАХ ЛІСОСТЕПУ УКРАЇНИ

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Досліджено динаміку та інтенсивність цвітіння, складено календар цвітіння калин в умовах Лісостепу України. Залежно від строків початку цвітіння виділені фенологічні групи: рослини, що рано зацвітають, пізно зацвітають та середніх строків цвітіння. Розглянуто особливості процесу розкриття пиляків деяких калин.

Ключові слова:

цвітіння, Viburnum, інтродукція, ріст, розвиток