Present and perspective cultivars of *Syringa* L. for greening the city of Novosibirsk

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Abstract. There is a need to correct a historical imbalance of ornamental shrubs and, in particular, hybrids and cultivars of genus *Syringa* L. in the city of Novosibirsk. Recent ambitious projects of reconstruction of the present green areas and creating the new ones have enhanced the relevance of testing the cultivars which have been conducted at the CSBG SB RAS for 35 years. In order to study further the features of biology and freeze resistance under continental climate of the south of West Siberia, CSBG's collection was completed with 54 new samples of cultivars of genus *Syringa* from 5 botanical institutions and nursery gardens located in the different climatic zones.

1 Introduction

The city of Novosibirsk is experiencing the shortage of ornamental bushes despite quite big green fund. According to the recent general plan of the city, its recreation zone total area including public green areas is 139sq.m. It is almost one third of the total city area. Meanwhile, natural ecosystems: pine and birch forests, wetlands, meadows and steppe communities make up more than half of this area. Quite small part of the public green areas belongs to cultural landscapes of parks and mini parks; the most of them are 50-70 years old. Vegetation on these territories is thickened, ornamental shrubs still remained there are in poor state due to the lack of regular and adequate plant care.

Owing to the circumstances, there are no big green areas with ecological conditions suitable for creating integral landscape compositions of ornamental shrubs with decorative effect. However, reconstruction of the current green areas and creation of the new ones started 5 years ago and revealed the need for modern assortment of ornamental bushes, and, first of all, reliable and tested cultivars of common lilac and hybrids of Villosaea Group. Current offers of these plants are disproportionate to the quantity and quality of planting material (there are not many checked and confirmed cultivars and there are not enough seedlings of standard size). That is why the work conducted at the CSBG SB RAS is so important for the city.

In the its laboratory of dendrology, Central Siberian Botanical Garden SB RAS, has been working with cultivars of common lilac since 1986 to create the collection and then to select the most promising cultivar for severely continental climate of forest-steppe zone of

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West Siberia. One hundred twenty six cultivars of foreign and domestic selection have been tested for the period of working with *Syringa vulgaris*. Currently the collection of *Syringa vulgaris* has 26 cultivars recommended for greening Siberian cities [1]. These cultivars are defined by remarkable winter resistance and can be recommended for using widely in greening the cities in cold climate zones of Russia, as well as in Northern Europe and Northern America. The cultivars acclimatized to the conditions of Siberia are represented by plants with their own roots plants grown from green cuttings, and they are more resistant to temperature fluctuations than grafted plants. This adds extra value to the collection.

2 Materials and methods

The collection of CSBG SB RAS includes thirteen the most famous French and German cultivars appeared at the end of the 19th century and in the beginning of the 20th century: ‘Andenken an Ludwig Spath’, ‘General Persching’, ‘Capitaine Baltet’, ‘Charles Joly’, ‘Condorcet’, ‘Guizot’, ‘Katherine Havemeyer’, ‘Mme Antoine Buchner’, ‘Mme Lemoine’, ‘Michel Buchner’, ‘Monge’‘Mont Blanc’, ‘Montaigne’. The domestic cultivars in the collection are the cultivars created by a famous soviet plant breeder Leonid Alexeyevich Kolesnikov: ‘Indja’, ‘Krasavitsa Moskvy’, ‘Krasnaya Moskva’, ‘Ogni Donbassa’, ‘Olimpiada Kolesnikova’, ‘Nadezhda’, ‘Pamyat’ o S.M. Kirove’. There are the cultivars of Siberian selection in the collection: ‘Altajskaya rozovaya’, ‘Dafna’, ‘Kruzhevnitsa’. They were bred by Luchnik Z.I., Doctor of Agricultural Science and Semenjuk N.B., PhD at the Research Institute of Horticulture of Siberia (Barnaul).

An assessment of cultivars of common lilac was carried out in order to identify cultivars with high economic and biological characteristics on the basis of long-term data. The following traits were studied: ability of vegetative reproduction, duration of flowering and resistance to diseases. According to the results of the complex assessment fifteen cultivars were found as the most promising for greening in the conditions of Novosibirsk city (cities in the south of West Siberia) [2].

Replenishment of CSBG’s collection and study of winter resistance have been continuing until now.

3 Results and discussion

In 2018 Vladimir Mikhailovich Reinwald gave us two-year-old seedlings of three introduced cultivars of *Syringa vulgaris* from the collection of Peter the Great Botanical garden BIN RAS (St. Petersburg). In 2019 Mrs. Elke Naase gave us two-year-old plants of 11 cultivars of *Syringa vulgaris* from the collection of the PICCOPLANT company (Germany), for their acclimatization and study of their winter resistance. Maxim Petrovich Leschinskiy (Saint Petersburg City Administration) brought in 2019 cultivars of 8 and in 2020 of 12 cultivars of *Syringa vulgaris* for the collection of the CSBG SB RAS. In 2020 and 2021 green cuttings of 16 late hybrids Villosaea Group from the collection of the Botanical garden of MSU (Moscow) were brought. The leader of the Creative group “Russian lilac” Sergei Alexandrovich Aladin, PhD., gave us of 12 cultivars of common lilac bred by this group. 7 of them were dedicated to the Great Victory [3]. All received cultivars are presented in the tables (Table 1, 2).

Table 1. Cultivars of *Syringa vulgaris*, received in 2018-2021

N	Cultivars names	Authors, year	Description
1.	‘President Loubet’	Lemoine, 1901	D VI

2.	‘Charles X’	Original not know, pre 1830	S VI
3.	‘Moskovskij Universitet’	Kolesnikov, Mironovich, 1968	D IV
4.	‘Mechta’	Kolesnikov, 1941	S III-IV
5.	‘Izobilie’	Kolesnikov pre 1959	D IV
6.	‘Komsomolka’	Kolesnikov ,1950	D IV
7.	‘Polina Osipenko’	Kolesnikov,1941	D I
8.	‘Andryusha Gromov’	Kolesnikov, 1968	D III-IV
9	‘Jeanne d’Arc’	Lemoine, 1902	D I
10.	‘Alesha’	Sakharova, 1973	S VI
11.	‘Mme Casimir Perier’	Lemoine, 1894	D I
12.	‘Etoile de Mai’	Lemoine,1905	D VII
13.	‘Prince Wolkonsky’	Bellion, 1995	D V/IV
14.	‘Liega’	Upitis, 1970	D I
15.	‘Frank Paterson’	Paterson, 1960	S VII
16.	‘Sarah Sands’	Havemeyer, 1943	S VII
17.	‘Princesse Clementine’	Mathieu pre 1906	D I
18.	‘Svityazanka’	Smol’skij, Bibikova, 1964	S VII
19	‘Wedgwood Blue’	Fiala, 1981	S III
20.	‘Mrs.Watson Webb’	Havemeyer pre1942	S VI
21.	‘Pamyat’ o Kolesnikove’	Kolesnikov, 1974	D II
22.	‘Ami Shott’	Lemoine, 1933	D III
23.	‘Znamya Lenina’	Kolesnikov, 1936	S VII-IV
24.	‘Glory’	Havemeyer, 1943	S VI
25.	‘Leonid Leonov’	Kolesnikov, 1941	S IV
26.	‘M.I. Kalinin’	Kolesnikov, 1941	S II-IV
27.	‘Flower City’	Feniccia, 1983	S II-VII
28.	‘Vechernij Zvon’	Aladin, Arckhangelskiy, Polyakova, Aladina, 2011	S V
29.	‘Tatyana Polyakova’	Aladin, Arckhangelskiy, Aladina, 2011	S I
30.	‘Mikhailo Lomonosov’	Aladin, Aladina, Polyakova, 2011	D I-II
31.	‘Vechernyaya Moscva’	Aladin, Arckhangelskiy, Polyakova, Aladina, 2011	D III-IV
32.	‘Marshal Bagramyan’	Aladin, Aladina, Polyakova, 2015	D VI & V
33.	‘Marshal Biryuzov’	Aladin, Arckhangelskiy, Aladina, Okuneva, Akimova, 2011	S V
34.	‘Marshal Konev’	Aladin, Arckhangelskiy,	D II

		Polyakova, Aladina,Okuneva, 2011	
35.	'Marshal Malinovskiy'	Aladin, Arckhangelskiy, Okuneva, Aladina, Akimova, 2011	D VI-V
36.	'Marshal Sokolovskiy'	Aladin, Arckhangelskiy, Polyakova, Okuneva, 2011	S VII
37.	'Olya'	Aladin, Arckhangelskiy, Polyakova, Akimova, 2011	S IV
38.	'Adelina'	Aladin, Aladina, Polyakova, Akimova, 2011	S II/V
39.	'Sinen'kij skromnij platochek'	Aladin, Polyakova, Okuneva, Akimova, 2011	S II

Table 2. Cultivars of *Syringa* Villosaea Group received in 2020-2021

N	Cultivars names	Authors. year	Description
1.	'Oberon'	Preston, 1937	S V
2.	'Francisca'	Preston, 1928	S VII
3.	'Elinor'	Preston, 1928	S III
4.	'Guinevere'	Preston, 1925	S VI
5.	'Ottawa'	Preston, 1953	S V
6.	'Isabella'	Preston, 1927	S IV
7.	'Calpurnia'	Preston, 1942	S IV
8.	'Desdemona'	Preston, 1927	S III
9.	'Charmian'	Preston, 1928	S IV
10.	'Bellicent'	Preston, 1937	S V
11.	'James Macfarlane'	Yeager, 1959	S V
12.	'Minuet'	Cumming, 1972	S VII
13.	'Miss Canada'	Cumming, 1967	S V
14.	'Hiawatha'	Skinner, 1932	S VI
15.	'Nellie Bean'	Yeager ,1959	S VII

The information contains the name of the cultivars, and the names of the hybridizers who named them, and the year when the cultivar was introduced. Notations S I - S VII or D I - D VII are used to briefly describe, whether the floret is single (S) or double (D), with more than one layer of petals in a floret. Roman numerals are used to define the predominant color of florets and/or inflorescence. Those details are also described in the frequently updated International Lilac Register, entrusted to the Royal Botanical Gardens, Hamilton, Ontario, Canada. The legend below provides the full definition of acronyms used:

S I single white
S II single violet
S III single blue
S IV single lilac

S V single pink
S VI single magenta (red)
S VII single purple
D I double white
D II double violet
D III double blue
D IV double lilac
D V double pink
D VI double magenta (red)
D VII double purple

Two Roman numerals can stand for florets containing two colors, such as D I & VI or colors combination is denoted by II / V, or color blend III – IV[4].

In return, the seedlings of introduces cultivars of common lilac of Siberian selection, created by Z.I.Luchnik at the Research Institute of Horticulture of Siberia (Barnaul) were given from the CSBG's collection to the Saint Petersburg City Administration and to the Botanical garden of the MSU (Moscow).

4 Conclusions

Thus, now the collection of the CSBG SB RAS contains 26 cultivars of common lilac (*Syringa vulgaris*), 15 of them are recommended for urban greening. Thirty nine new cultivars of *Syringa vulgaris* and 16 hybrids (Villosaea Group) are on trial for further study of biological features of cultivars and winter resistance in the conditions of continental climate of the south of West Siberia and for subsequent using the most promising cultivars and hybrids for greening the cities of the south of West Siberia.

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