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Introduction of kinds of genus *Spiraea* L. in the Amur area (Russia).

The Amur area is located in moderate breadthes on east suburb of the Asian continent. For the Amur area sharply continental climate with features monsoonal is characteristic. Winter is severe, long and almost snowless. In the spring and autumn periods the big daily amplitudes of temperature and atmospheric pressure are natural. Two periods in the summer are allocated: dry in June and humidified in July and August. The mid-annual temperature of air in Amur region changes from - 8 ° (pool Njukzhi) in northwest up to 0 ° in the south of (Blagoveshchensk). Ground of meadow type of soil formation, and also brown ground soil formation prevail.

Introduction is understood as purposeful activity of the person on introduction in culture in the given natural-historical area of plants, earlier in it not growing, and also carries of plants to culture from local flora.

Genus *Spiraea* unites about 90 kinds distributed mainly in forest-steppe, steppe and semidesertic zones and in a subalpine zone of mountains of northern hemisphere. The southern border in Asia passes on east and northern the Himalayas, in America - by the central part of Mexico.

Now in a collection of the Amur branch of botanical garden - institute of the Far East Branch of Russian Academy of Science it is totaled 27 kinds, forms, hybrids and grades *Spiraea* mentioned in the given work. From them 17 kinds are wild-growing, they are raised by us for studying the phenomena of variability, morphogenesis, stability, and also annual registration of the phenological data. In collection kinds of various sections - *Spiraria*, *Chamaedryon*, *Calospira*, and a various origin - from Northern America, Asia, Japan-China, Europe, Siberia and the Far East are submitted.

Creation of a collection is begun since 2001. In culture a prevailing way of duplication is seed, therefore we have preferred it. At duplication used the seeds sent from botanical gardens and collected independently during expeditions over the Far East of Russia. Alive plants are brought from various areas of the Amur area, Altai, Primorski region. Two-year-old saplings are received from nurseries of the Central Siberian botanical garden (Novosibirsk), the Main botanical garden (Moscow), and the Botanical garden of Botanical institute (Saint Petersburg).

In gardening city of Blagoveshchensk *Spiraea* meets seldom, as a rule, in gardens at fans - gardeners, and at the biological station belonging to the Blagoveshchensk state pedagogical university. Only last year's various forms of *Spiraea japonica* began to land in connection with increase of volumes of construction and an accomplishment of territories.

The best way of cultivation of landing material of *Spiraea* in the Amur area is spring sowing of seeds in boxes. Plants at such planting have more advanced root system that provides good plant percent. At sowing in boxes shoots appear for 6-7 day, at crop in a ground - on 9-15 days Occurrence of the first present sheet in hothouse conditions is observed for 15-22 day, in conditions of an open ground - on 22-26 days. Sword-play of seedlings are the best way for carrying out after occurrence of 2-3 present leaflets as earlier sword-play is ineffective because of the small sizes of plants. Careful maintenance of moisture in the top layer of ground and shading of sowing is necessary. In the first year seedlings height up to 20 cm achieve and can have 3-5 stalks. Plants of 3-4 years landed on a constant place. All kinds blossom, but only 15 taxons give mature seeds. Such kinds as *S. beauverdiana*, *S. humilis*, *S. trilobata* at all do not fasten or form outstanding seeds.

Spiraea media and *S. ussuriensis* made multiple copies division of a bush. Modelling bushes (about 15) have landed May, 29. Terms of approach of phenological phases are specified in table 1.

At an estimation of perspectivity *Spiraea* in the Amur area we used a technique of success of introduction of wood plants which Lapin, P.P. and employees of laboratory of dendrology of the Main botanical garden have developed in 1974 (table 2).

By an integrated estimation of success of introduction it was revealed, that in conditions of the Amur area as perspective kinds are considered *Spiraea ussuriensis*, *S. salicifolia*, *S. media*, *S. chamaedryfolia*, *S. virgata*. But it is only preliminary data by results of 4th years.

Earlier we investigated laws of intraspecific variability of some kinds *Spiraea* distributed in territory of southern Siberia and the Far East. Interest represents studying character and features of intraspecific variability *Spiraea* in conditions of introduction. We shall consider processes of variability of attributes in conditions of introduction on an example of kind *S. flexuosa*. Copies of a modelling population (about 60) were brought up from seeds by sowing in boxes. Parameters of attributes of natural populations are given as average of 5 investigated populations growing in territory of southern Siberia and the Far East. The investigated attributes and their values are specified in table 3.

In conditions of cultivation all parameters of morphological attributes appeared above, than in conditions of natural populations. Agrotechnical actions have influenced this fact. Exception makes an attribute «angle of pedicels» that is connected to distinction in the age of populations. All specimens of cultural population *S. flexuosa* have age 4 years. In a nature the investigated populations are more senior on age, from 8 till 12 years.

The factor of a variation describing a level of variability of metric attributes, at the majority of attributes is higher and it is determined as average and high (fig. 1). The given fact, probably, is connected to a different origin of parent bushes.

Decorative effect *Spiraea* does not cause doubts. Using in gardening early blossoming and late blossoming kinds *Spiraea*, are possible to achieve long decorative effect. Species of *Spiraea* are beautiful not only during flowering. The form of a crone, colouring of runaways, graceful foliage of many kinds are decorative during all vegetative period.

Kinds of *Spiraea* are suitable and in single plantings, on lawns, in composite groups of different kinds and the forms distinguished on capacity of growth and on terms of flowering, in combinations to other beautifully blossoming bushes in a bordering of marges of decorative groups, for plantings along various protections with the purpose of their dressing and mitigation of a thermal mode (table 4). *Spiraea* can be applied to a covering of slopes, for creation of curtains on the covered platforms.

Thus, kinds of genus *Spiraea* are steady against external factors of environment in conditions of the Amur area. The best way of cultivation of a landing material is spring sowing of seeds in boxes. Variability of morphological attributes *S. flexuosa* in a population in conditions of cultivation appeared above. Further, taking into account economic resources *Spiraea*, their endurance to adverse conditions of a climate, introduction of new decorative kinds is necessary for studying and wider distribution in gardening our city.

Table 1

Terms of approach of some phenological phases *Spiraea media* and *S. ussuriensis*

Phenological phases	<i>Spiraea media</i>	<i>Spiraea ussuriensis</i>
Swelling of kidneys	May, 5-9	May, 8-12
The beginning of flowering	June, 5	June, 7-11
The end of flowering	June, 19-22	June, 21-23
The termination of growth of runaways	August, 23 - September, 11	August, 25 - September, 3
The beginning of maturing of seeds	July, 1 - 4	July, 1 - 7
Mass maturing of seeds	July, 10 - 16	July, 11 - 14
The beginning of a leaf fall	September, 15 - 24	September, 6 - 18
Mass leaf fall	September, 25 - 30	September, 18 - 27

Table 2

Estimation of introduction *Spiraea* in the Amur area

Kind	Score	Class of perspectivity	The basic parameters						
			Degree of annual ripening of runaways (20)	Winter hardiness (25)	Preservation of habitus (10)	Ability to formation of runaways (5)	Gain in height (5)	Ability to generative development (25)	Ways of duplication in culture (10)
<i>S. beauverdiana</i>	60	4	15	20	5	3	1	15	1
<i>S. betulifolia</i>	62	3	15	20	5	3	1	15	3
<i>S. chamaedryfolia</i>	78	2	15	20	10	5	5	20	3
<i>S. flexuosa</i>	73	3	10	20	10	5	5	20	3
<i>S. Fritchiana</i>	75	3	15	20	10	5	5	15	5
<i>S. humilis</i>	65	3	10	25	5	3	1	20	1
<i>S. media</i>	90	2	15	25	10	5	5	25	5
<i>S. salicifolia</i>	95	1	20	25	10	5	5	25	5
<i>S. trilobata</i>	34	5	5	20	5	1	1	1	1
<i>S. ussuriensis</i>	95	1	20	25	10	5	5	25	5
<i>S. virgata</i>	88	2	20	25	10	5	5	20	3

The note. In brackets the maximal values of parameters are given.

Table 3

Intraspecific variability of *Spiraea flexuosa*

Attribute	Populations			
	In conditions of nature		In conditions of cultivation	
	I	II	I	II
Length of a sheet	26-47	35,4±1,19	27-57	39,7±1,74
Width of a sheet	14-23	18,4±0,6	18-27	21,3±0,68
Distance from the basis of a sheet up to its wide part	10-18,6	13,5±0,49	11-22	15,7±0,67
The top corner of a sheet	27-49	36,7±1,25	30-65	39,6±1,76
The bottom corner of a sheet	40-66	52,0±1,6	37-79	59,3±2,6
Length of petiole	2-5	3,7±0,12	4-10	6,6±0,34
Length of bud	1,3-2,8	1,96±0,1	1,2-2,5	1,9±0,08
Angle of pedicels	106-136	120±1,5	57-110	82,1±3,7
Number of pedicels	6-12	8,6±0,38	6-16	10,5±0,73

The note: I - the minimal and maximal value of an attribute; II - average value of an attribute and its mistake.

Table 4

Use in plantings wild-growing kinds *Spiraea*

Kind	Single plantings	Group plantings	The Alpine hills, slopes	Borders, borderings	Green hedges	Creation of margs	Coast of reservoirs
<i>S. beauverdiana</i>	+	+	++	++			
<i>S. betulifolia</i>	+	+	+	++			
<i>S. chamaedryfolia</i>	+	++	+		+		
<i>S. crenata</i>		+	+	++			
<i>S. dahurica</i>	+	+	+				
<i>S. elegans</i>	+	+	++		+		
<i>S. flexuosa</i>	+	+	++		+		
<i>S. humilis</i>	+	++	+			++	+
<i>S. hypericifolia</i>		+	++				
<i>S. media</i>	+	++	+	+	+	+	
<i>S. pubescens</i>		+		+			
<i>S. salicifolia</i>	+	++	+		+	++	+
<i>S. trichocarpa</i>	+	+					
<i>S. trilobata</i>		+	++	+			
<i>S. ussuriensis</i>	+	+	++	+			

The note. "++" - preferable use; "+" - possible use.

Levels of variability of Spiraea flexuosa

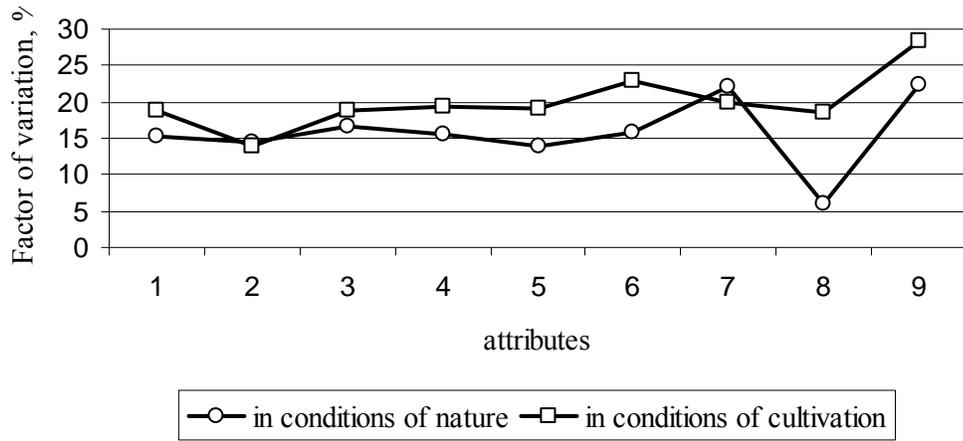


Fig. 1