A STUDY OF THE MINERAL COMPOSITION OF THE UNDERGROUND ORGANS OF SYRINGA VULGARIS

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Introduction. Syringa vulgaris is one of the most common and favorite ornamental plants all over the world. There are more than 600 different species of this shrubbery. This diversity of species promoted to use the plant for landscaping parks and public gardens in many countries. However, Syringa vulgaris is known not only for its unique beauty, fragrance and resistance to various natural and climatic conditions, but also valuable medicinal properties.

The chemical composition of lilac is very diverse. The major active ingredients are flavonoids, coumarins, tannins, iridoids, vitamins and a glycoside syringin. Syringa vulgaris has been used for a long time in folk medicine for the treatment and prevention of numerous diseases, such as kidney stones, colds, malaria, nervous disorders, diabetes. It is also used to treat wounds, bruises and other injuries. The plant is an excellent and almost the only remedy in the treatment of the joints (arthritis, rheumatism, gout) due to its strong anti-inflammatory action. The officinal medicine uses the Syringa vulgaris bark as a raw material for syringin (eleutheroside B) obtaining, which is a marker for standardization of drugs derived from the rhizomes and roots of Eleutherococcus senticosus.

Aim. A wide range of biological action of Syringa vulgaris is a promising direction for its phytochemical research. The aim of our study was to investigate the mineral composition, qualitative and quantitative content of macro- and microelements in the underground organs of Syringa vulgaris. Raw materials were harvested in autumn of 2014 and 2015 at Kharkiv region.

Materials and methods. The mineral composition was determined using atomic emission spectrographic method. For obtaining spectra and their registration on photographic plates, a DFS-8 spectrograph with a diffraction grating of 600 lines / mm and a three-lens system lightening of the gap was used. Spectra were registered in the region 230-330 nm. The content of the element at the cinders (a, %) were found using the calibration curve.

Results and discussion. Element content (x, %) in the ash of roots of Syringa vulgaris was calculated by the formula: $x = \frac{a \cdot m}{M}$,

where m – ash weight (g), M – mass of raw material (g), a – the element content in ash (%). Results are reported in Table 1.

Table 1

Results of the analysis of the mineral composition
of Syringa vulgaris roots

№	Element	Content, mg / 100 g
1.	Fe	16.00
2.	Si	70.00
3.	P	80.00
4.	Al	6.90
5.	Mn	1.10
6.	Mg	80.00
7.	Pb	<0.01
8.	Ni	0.34
9.	Mo	<0.03
10.	Ca	230.00
11.	Cu	0.23
12.	Zn	1.10
13.	Na	23.00
14.	K	575.00
15.	Sr	<0.01

As seen in Table 1, 15 elements were found. Seven of these elements (Fe, Si, P, Mg, Ca, Na, K) belong to macronutrients, 8 – to micronutrients (Al, Mn, Ni, Mo, Cu, Zn, Sr). It should be noted that the underground parts of the plant have a high content of potassium (575.00 mg/100 g), calcium (230.00 mg/100 g), magnesium (80.00 mg/100 g), phosphorus (80.00 mg/100 g) and silicon (70.00 mg/100 g). Roots of plant also accumulate sodium (23.00 mg/100 g), iron (16.00 mg/100 g) and aluminum (6.90 mg/100 g), but in smaller quantities. The heavy metal content didn't exceed 0.01 mg/100 g.

Conclusions. The conducted researches prove the existence of a significant number of macro- and microelements in underground organs of Syringa vulgaris. Results of the analysis of the mineral composition will be used for new drugs creation, in developing methods of quality control of plants from the Syringa genus.