

## Biebersteinia Multifida as a Valuable Medicinal Plant of Uzbekistan

Islamova Z. B

Samarkand State Medical University

[zebo.oy@mail.ru](mailto:zebo.oy@mail.ru)

**Abstract:** Using the method of mass spectrometry with inductively coupled argon plasma *Biebersteinia multifida* DC. The macro - micro - and ultramicroelement composition of the plant was investigated. It was determined that the above-ground and underground plant organs contain 44 different elements with a large variety of useful for the living human organism.

**Keywords:** *Biebersteinia multifida* DC, macroelements , microelements, ultramicroelements , potassium, calcium, root, leaves, content, analysis, method, chemical, argon, plasma, chemistry, inductive, spectrum, metrics, organism, order, element, differentiation.

### Introduction.

*Biebersteinia* species As a valuable medicinal plant, it is widely used in folk medicine. Scientists have discovered that the major chemical categories of *Biebersteinia species* include flavonoids, alkaloids, phenylpropanoids , terpenoids , essential oils and fatty acids. And also proven anti-inflammatory, analgesic, antibacterial, antioxidant, antispasmodic, hypotensive, hypoglycemic and anti-atherosclerotic effects of four species of *Biebersteinia* [3;4;5;6].

*Biebersteinia multifida* D.C. \_ in the conditions of Uzbekistan, it mainly grows in mountainous regions, at an altitude of over one and a half thousand meters.

*Biebersteinia multifida* is a perennial herbaceous plant with thick roots , 30-65 cm high [1;2] . covered with thin hairs that sit on short but thick legs, has a very strong aroma. *Biebersteinia* flowers *multifida* actinomorphic, located at its apex in an inflorescence , they are arranged in a thick raceme. The stalks have thick and long hairs. The petals are yellow, broadly obovate in shape. O produces 4 - 5 seeds. The diameter of one seed is 4.5-5.6 mm. The plant reproduces naturally: by seeds and roots . Prefers poor (typical gray soil) soil. Blossoms and bears fruit in April-June. The roots are thick and dense, light to dark brown in color. [1 ; 2 ; 7 ; 8 ; 9].

The root of this plant has been used in folk medicine in the western region of Iran to treat musculoskeletal diseases and repair bone fractures. Anti-inflammatory and analgesic activity of *Biebersteinia root extract has also been reported multifida* DC. [3;5;6;7;8;9].

**The purpose of this work is** to study the macro-micro- and ultra-microelement composition of the *Biebersteinia plant multifida* by inductively coupled argon plasma mass spectrometry.

**Materials and methods of research.** Samples plants for analysis were collected in early May. During the flowering period, the vegetative organs of the plant are collected: the above-ground part of

the shoot, leaves and the underground part - root crops. The optimal place for drying is shady conditions. The plants were sown in the shade in the fresh air, the leaves and leaves were tied into bunches, hung with flowers down or laid out on shelves covered with dry cotton cloth.

Thoroughly cleaned of soil and other mechanical impurities by washing, the fruits were laid out on a prepared cloth so that they did not overlap each other and were dried.

The study of macro-, micro- and ultra-microelement content was carried out using inductively coupled plasma mass spectrometry (ICP-MS). Sample preparation was carried out using the method of wet acid-peroxide gardening using an X-Expert device.

For quantitative determination, standard solutions of multielements were used. To eliminate the background, the UCT™ universal quadrupole system was used in the range from 1 to 285 AU. eat.

**Analysis conditions:** Device: NexION-2000. Perkin - Elmer with Syngistix™ software for ICP-MS (USA); argon gas flow – 15 l/min; peristaltic pump speed - 1.2 ml/min; detector – quadrupole mass analyzer; generator power – 1500W. To verify the device, standard samples of solutions of elements GSO 7759-2000 (Be), GSO 7268-96 (Co), GSO 7252-96 (Pb), GSO 7472-98 ( Cd ) were used (relative error limits ( $P = 0.95$ )  $\pm 1.0\%$ ).

**Research results.** The results of chemical experiments identified 44 types of macro-, micro- and ultra-microelements in the roots and leaves of the *Biebersteinia plant multifida* \_

Chemical elements, together with water in the body, are building materials, catalysts of biochemical reactions, stabilizers of proteins and enzymes, ensuring the constancy of osmotic pressure, acid-base balance, processes of absorption, secretion, hematopoiesis, bone formation, and blood clotting. Thanks to the presence of elements, the process of muscle contraction, nerve conduction and intracellular respiration is carried out. Chemical elements in the body are found in the form of various compounds and salts. Each element has its own physiological working range of concentrations, ensuring the normal course of physiological reactions in the body.

Chemical elements are classified according to their role as macro-, micro- and ultra-microelements .

Contents of macroelements, calcium and potassium in *Biebersteinia roots multifida* is the highest, from 2.4% Ca and K to 1.01%, the potassium content is the highest in the leaves of the plant and is 0.55%. Also, we found that from macroelements in the roots of *Biebersteinia multifida* : Na 0.014 %, Mg 0.17%, Al 0.064%, Si 0.067%, P 0.36% and Fe 0.033% occur. The macroelements found in the leaves are Na 0.015 %, Mg 0.19%, Al 0.054%, Si 0.051%, P 0.36%, Ca 0.17 % and Fe 0.015%.

From microelements, in the leaves and roots of *Biebersteinia multifida* the highest content is boron (in roots 6.811 mg/kg, leaves 4.756 mg/kg), manganese (in roots 3.645 mg/kg, leaves 1.463 mg/kg), zinc (in roots 2.122 mg/kg, leaves 1.312 mg/kg ). Also found among microelements are Li , V , Gr , Co , Ni , Cu , Ru , Zn from 0.017 to 0.245 mg/kg in leaves and from 0.014 to 0.410 mg/kg in roots .

About the content of ultramicroelements in *Biebersteinia multifida* are defined by As , Nb , Cd , Sb , Cs , Re , U , etc. d. In the roots, arsenic was determined to be 0.018 mg/kg and cadmium 0.02 mg/kg, and in the leaves there was less arsenic - 0.007 mg/kg, cadmium 0.002 mg/kg. The amount of other ultramicroelements is distributed almost evenly throughout all organs of the plant; only rhenium is absent in the leaves.

### conclusions

1. By content macro-, micro- and ultra-microelements in the roots and leaves of the *Biebersteinia plant multifida* DC. not inferior to previously known, famous medicinal plants like *Lagochilus inebrians*, *Ferula assa-foetida*, *Glycyrrhiza* and etc.

2. Study of the chemical composition of *Biebersteinia multifida* once again confirms the experience of using traditional medicine as an anti-inflammatory, analgesic, antibacterial, antioxidant, antispasmodic, hypotensive, hypoglycemic and anti-atherosclerotic agent. After further research, it may add to the arsenal of scientific medicine.

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