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## DETERMINATION OF ELEMENTAL CONTENT OF FOUR BULGARIAN MEDICINAL PLANTS BY MEANS OF INSTRUMENTAL NEUTRON ACTIVATION ANALYSIS

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**Statement of the Problem:** Medicinal plants play a major role both in traditional and conventional medicine due to their natural abundance and variety of beneficial health effects. The wide use of plants brings up a necessity to understand their composition and evaluate the risks and benefits of consumption. Most of the studies dealing with medicinal plants are focused on complex constituents such as antioxidants, enzymes, volatile oils and others. Unfortunately this trend of research leads to a lack of information regarding the elemental content of the medicinal plants. Elemental content could be crucial in order to understand the health effects of the plants. This is due to the potential presence of two groups of elements: essential elements and toxic elements. Essential elements play a major role in human physiology and must be obtained from diet. The presence of toxic elements, on the other hand, might be hazardous to the consumer and lead to health problems.

**The purpose of this Study:** In the present work the elemental content of four widely used Bulgarian medicinal plants was studied in order to fill the aforementioned informational gap.

**Methodology & Theoretical Orientation:** The elemental content of four Bulgarian medicinal plants (*Sanguisorba officinalis* L., *Sideritis scardica* Griseb, *Chamaenerium angustifolium* L., and *Tribulus terrestris* L.) was studied by means of instrumental neutron activation analysis. The studied plants are widely used in traditional Bulgarian medicine and have been reported to display healing properties. Previous information for their elemental composition is scarce.

**Findings:** The mass fractions of twenty eight elements (Al, As, Au, Ba, Br, Ca, Cd, Cl, Co, Cs, Fe, K, La, Mg, Mn, Mo, Na, Rb, S, Sb, Sc, Sr, Sm, Th, U, V, W, Zn) were determined.

**Conclusion & Significance:** Among those elements thirteen dietary minerals (Ca, Cl, Co, Fe, K, Mg, Mn, Mo, Na, Ni, S, V, Zn) and four toxic (As, Ba, Cd, Sb) were detected.

### Biography

Atanas Vasilev a junior researcher at the Sector of Neutron Activation Analysis and Applied Research at the Frank Laboratory of Neutron Physics of the Joint Institute for Nuclear Research in Dubna, Russia. He is an MSc in Biophysics of the Faculty of Physics in Sofia University, Bulgaria. Interest includes Life Sciences, nuclear and related analytical techniques used to study plant medicinal plants, environmental studies and statistics of large arrays of environmental data. Previous professional experience includes Bulgarian Academy of Sciences, Institute of Plant Physiology and Genetics.

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