



**Ss Cyril and Methodius University, Faculty of Natural Sciences and
Mathematics, Institute of Chemistry,
Skopje, Republic of Macedonia**

**Goce Delčev University, Faculty of Agriculture,
Štip, Republic of Macedonia**

17th International Symposium and Summer School on Bioanalysis

BOOK OF ABSTRACTS



2–8 July 2017

Congress Centre, Ohrid, Republic of Macedonia

Organizers and sponsors:

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WELCOME

Dear Colleagues and partners in the CEEPUS network,

It is my pleasure and honor to welcome you and your co-workers to the 17th International Symposium and Summer School on Bionalysis (17th ISSSB) organized in Ohrid, Republic Macedonia, from 2 to 8 July 2017.

The event is organized in the framework of CEEPUS CIII-RO-0010-11-1617 network. The aim of the Symposium and Summer School is to enable students and young researchers to learn and share knowledge, information and ideas about the current progress in the analytical techniques.

The symposium focuses on the recent achievements in the mainstream fields of application of analytical techniques and bioanalytical methods in chemical and pharmaceutical research, and related topics.

The scientific program includes plenary lectures, oral and poster presentations. Special attention will be given to the young researchers with sessions of podium poster communications.

I wish you a pleasant and memorable stay in Ohrid.

Trajče Stafilov

Symposium Chair, 17th ISSSB

17th International Symposium and Summer School on Bioanalysis

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**ASSESSMENT OF ARSENIC POLLUTED GROUNDWATER IN
THE STRUMICA REGION, AN INTENSIVE AGRICULTURE
PRODUCTION AREA**

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Arsenic polluted groundwater was found in the south-east part of the Republic of Macedonia where an intensive agriculture production is concentrate on the area of 963 km². Out of 185 samples collected from boreholes, 64 samples have arsenic in concentrations greater than 10 µg/L, from which 30 samples have concentration greater than 50 µg/L with maximum concentration of 176.56 µg/L. The affected aquifers are mostly concentrated in the central part of the valley characterized with alluvial plains and young aquifers. Polluted samples are collected from boreholes with different depths: 15 samples are shallow (4,5 - 20 m), 42 samples are deep (21-100 m) and 7 samples have depth greater than 100 m. The contaminated groundwater is slightly acidic to neutral (pH between 7.5 – 8.53), with high alkalinity (HCO₃⁻ 177.06 – 511.87) and moderate conductivity (EC_w 2.48 – 7.2). Highly affected samples are characterized with high concentrations of Mn and Fe. Other investigated ions such as Mg, Na, K, Ca, P, Cu, Ni, Co, Zn and Pb are present in low concentrations. Factor analysis revealed high positive correlation between arsenic, iron and manganese which suggest the natural origin of arsenic in groundwater. Reducing environment, high iron, high manganese and bicarbonate content, as well as low sulfate and nitrate content, show that reductive dissolution is one of the mechanisms by which arsenic is released into the groundwater [1].

Keywords: agriculture, boreholes, irrigation, geochemical composition, factor analysis.

References:

- [1] P. Ravenscroft, H. Brammer, K. Richards, Arsenic Pollution: A Global Synthesis. 1st Ed.; John Wiley & Sons, Ltd.: Chichester, UK, 2009, p. 617.