Serbian Society of Soil Science

University of Belgrade, Faculty of Agriculture

BOOK OF ABSTRACTS

3rd International and 15th National Congress

SOILS FOR FUTURE UNDER GLOBAL CHALLENGES

21–24 September 2021

Sokobanja, Serbia

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FOREWORD

The Serbian Society of Soil Science continues its tradition of hosting conferences, which is one of its primary activities. It organized the 3rd International and 15th National Congress – Soils for Future Under Global Challenges in the International Decade of Soils 2015–2024, collaborating with the University of Belgrade Faculty of Agriculture and under the auspices of the Ministry of Education, Science and Technological Development of the Republic of Serbia, along with sponsors and numerous contributors of papers. Namely, the International Union of Soil Sciences (IUSS) proclaimed the International Decade of Soils 2015-2024. In the Vienna Soil Declaration of 7 December 2015, IUSS recognized the key roles soils play in addressing major resource, environmental, health and social challenges currently facing humanity.

Due to the COVID-19 pandemic, the Congress was held as an online event, in combination with limited physical presence of international and domestic participants who observed the prescribed epidemiological measures and recommendations of the Serbian Government.

The topics of the Congress were grouped into the following four sessions: (i) Soil fundamentals, (ii) Soil-water-plant-atmosphere continuum, (iii) Soil degradation and soil and water conservation, and (iv) Soil and water future socio-economic pathways. The thematic areas were selected to support the distinct efforts of agriculture, and humankind in general, to deal with current resource, environmental, health and social issues.

Growing population pressures, industrialization and intensive use of soil exhaust natural resources and limit the performance of soil functions, such as biomass production, water purification, carbon sequestration, and the like. The additional impacts of climate change, land use changes and the above mentioned global changes affect the ability of soils to regenerate and even lead to degradation. The future capacity of soils to support life on Earth is in question.

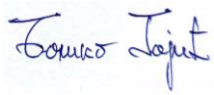
A number of conferences on soil and global changes have been held worldwide over the past several years. Continuing these efforts, we need to keep in mind that the study of soils has changed rapidly. Previously, soil science was seen as supporting agriculture and forestry, and justified by increased soil productivity. However, the focus has recently expanded considerably. Soil science is now a major component of each environmental science course, given that soil plays a key role in elementary natural cycles. Soil pollution is also extremely important, often more persistent than air or water pollution. The impacts of global changes on soils are viewed from a much broader perspective than only several decades ago. However, despite the interest in new fields, the agricultural imperative must not be forgotten. Agriculture remains the main economic purpose of the use of soils and hunger is certainly among the most serious potential disasters set off by global changes.

Ninety-eight contributions were accepted for presentation at the Congress and included in this Book of Abstracts. They reflect the outcomes of the most recent research in 17 countries worldwide. The contributions were prepared by more than 320 authors and co-authors. This shows that most of the presentations were a result of teamwork, which not only guarantees a comprehensive approach, but also quality.

Seven distinguished domestic and international professors and scientists prepared the keynote speeches. The submitted papers are available on the website of the Serbian Society

of Soil Science (https://congress.sdpz.rs). The contributions contained in this Book of Abstracts have been reviewed by international peers.
An excursion completed the program and content of the Congress. It included showing of four soil profiles of the dominant soil types in the Sokobanja area, including Calcomelanosol, Brownized Calcomelanosol, Calcocambisol and Vertisol, under different land uses (native meadow, devastated native pasture, native forest and intensive apple orchard).
It is our wish to see all the positive outcomes of the Congress implemented in due course, along with recommendations of scientists and professionals. This would fulfil the objective of the Congress in the best possible way. The permanent legacy of the Congress should be the inclusion of soil in the core of policies that support environmental protection and sustainable development.
In closing, I wish to express once again my sincerest gratitude to all who contributed to the publication of this Book of Abstracts.

September 2021 in Sokobanja



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PLATINUM GROUP ELEMENTS AND RARE EARTH ELEMENTS IN URBAN PARK SOILS IN NOVI SAD, SERBIA

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Abstract

The aim of this research was to study the behaviour of "new" pollutants released from car catalytic converters in selected top and bottom soils in two urban parks in Novi Sad. The study of the anthropic pollution by a geochemical multi-element approach could be a useful tool overall in urban areas characterized by a high environmental complexity. Different catalysts honeycomb display typical Platinum Group Elements (PGE) and Rare Earth Elements (REE) associations and concentration levels not common in soil and, at the end, in the "natural" environment. Characteristic fingerprint that they displayed permit us to evidence the presence of particles derived from car catalysts. In Serbia, car catalyst introduction is relatively recent respect to other European Countries. Therefore, the preliminary data show that, among PGE, Pt and Pd concentration levels are 0.89 and 0.85 ng/g respectively, resulting still lower or very close to the typical geochemical background for these elements in natural soils and rocks. Then, the presented data can be utilized as useful reference values to assess their accumulation trend in Serbian urban soils. Concerning REE that are usually contained in high percentages in the catalyst honeycomb and released with PGE via car fume, the average concentrations of light REE (LREE) result lower in Novi Sad top soils (ΣLREE 112 mg/kg) than in Rome (ΣLREE 427 mg/kg), where catalyst were introduced in the early 90s and soil parent material is mainly derived from volcanic rocks. However, the REE distribution patterns result very similar in both cities as well as the REE concentration levels. These preliminary data evidence that the urban environment is continuously exposed to new pollutants in relation to changes in anthropic activity. Environmental safeguard require useful and innovative tools to check and study the fate of these potential pollutants overall in relation to potential negative effect on population.

Keywords: PGE, REE, park soils, pollution, Novi Sad, Serbia