



Oil pollutants in alluvial sediments of the Sava river, Serbia

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Introduction

In the capital of Serbia, Belgrade, one of the largest heating plants in the Balkan is localized near the Sava River (New Belgrade), and represents a potential source of oil pollution for the alluvial area of the Sava river (Fig.1.).

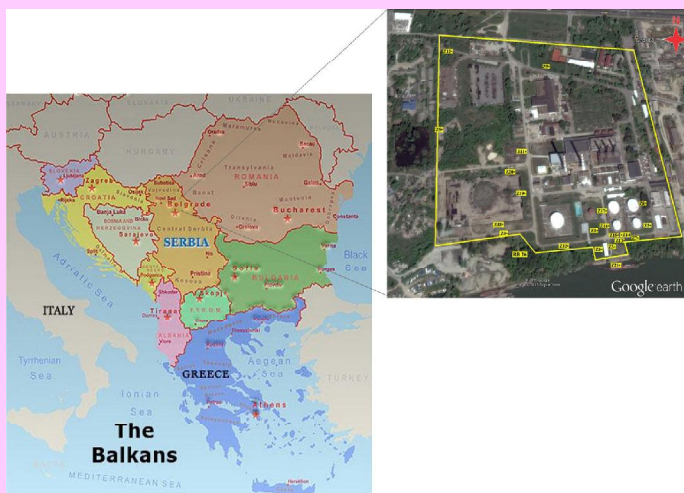


Fig.1. Maps of Belgrade (Capitol of Serbia) and microlocations of the alluvial plains of the Sava River.

Presence of different oil pollutants in the sediments and soils of Sava river has already been confirmed [1]. The aim of our research was to determine the presence of oil pollutants as well as their vertical migration in the alluvial area of Sava river.

The investigation was started in the summer of 2015. The soil was sampled in 20 different microlocations, at 5 depths (up to depth of 2m). The sampled material was organized in the form of layers, and for each microlocation was made a lithological profile. Most of the samples have had a sandy and clayey structure with low content of organic matter.

Materials and methods

Extraction of oil pollutants from soil samples were done using the Soxhlet apparatus with dichloromethane. The extracts were then fractionated by column chromatography into fractions of: saturated hydrocarbons (Fraction I), aromatic hydrocarbons (Fraction II), and polar compounds (alcohols and keto compounds (Fraction III) [2].

In order to monitor changes in the vertical migration of oil pollutants, as well as the relationship of this migration with the soil characteristics, the group composition was determined for each borehole of all microlocations, taking into account their lithological profiles.

Results and discussion

The obtained results showed that in all extracts the most represented were polar compounds (Fraction III), while the saturated hydrocarbon were least represented (Fraction I). This relationship is almost unchanged in samples from different microlocation at different depths (Fig.2.).

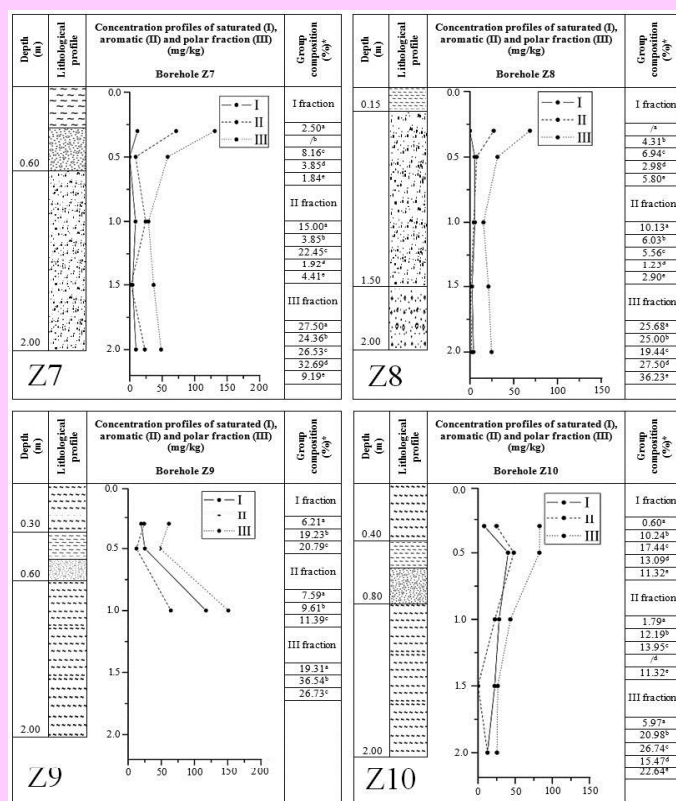


Fig.1. Vertical migration profiles of different organic fractions from samples Z7, Z8, Z9 and Z10.

Conclusion

On the basis of the obtained results, it can be concluded that composition of oil pollutants can be unchanged through the alluvial sediments up to 2m depth. Deeper penetration of these pollutants can be related to the characteristics of the surrounding soil environment.

Acknowledgements: This work was supported in part by Ministry of Education, Science and Technological Development of the Republic of Serbia, Project No: III 43004.

References

- [1] Miletić S., Ilić M., Avdalović J., Šolević Knudsen T., Beškoski V.P., Branimir Jovančičević B., Vrvic M.M., *EMEC16 - 16th European Meeting on Environmental Chemistry*, Torino, Italy, 2015.
- [2] Jovančičević B., Antić M., Šolević T., Vrvic M.M., Kronimus A., Schwarzbauer J., *Environmental Science and Pollution Research*, 12, (2005) 205.