

Eastern Posavina as unique geologic and hydrogeologic system

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The geochemical survey on soils has huge significance for determining the anthropogenic source of metals in total metal content from sediments, that could origin from both sources. In order to obtain a complete picture, geological mapping and impact on specific area should be done.

The investigated area included the eastern part of the Posavina Basin from the furthest north-western part of Jadar block terrane (sampling sites Zasavica Special Nature Reserve of the first category in the Ramsar List, Batrovci, Bosut and Jamena locality).

In period between 2010 and 2014 all investigations were performed on samples from depth to 0.50 m. Sediment were analyzed for Ni, Zn, Cd, Cr, Cu and Pb by flame atomic absorption spectrometry-FAAS (Perkin Elmer, AAnalyst 700).

The heavy metal content of this alluvial plain and loess terraces area are variable like Ni (14 – 47 mg/kg), Zn (70 – 265 mg/kg), Cd (2,7–4,0 mg/kg), Cr (4 – 32 mg/kg), Cu (28 – 68 mg/kg) and Pb (5 – 101 mg/kg). Except Cr, the most of the obtained range values were higher than Upper Continental Crust (UCC) from sedimentary and loess data (Rudnick and Gao, 2004)). Several studies collaborate to this hypothesis related to Chemical Proxy of Alteration (CPA, 60-95) from Jadar unit and neighbor representative catchment areas (Grba et al., 2014, Buggle et al., 2011 and Šajnović, 2008). The direction of hillslope transport are as follow: from north it is Fruska Gora Mountain with serpentinite soils from ultramafic rocks, Cer Mountains mostly with a plutonic composition and from south and from east Bosnian Mountains mainly Majevisa as part of Internal Dinarides Ophiolites mélange. Contributions of geochemical process have direct and dominant influence on concentrations of heavy metals in this region. Taking into account the background values for this region (Grba et al., 2014) anthropogenic impacts are small in extent, dominantly by zinc moderately to strongly polluted which have dual origin (geological and anthropogenic) and cadmium with considerable ecotoxicological risk at all sites except Zasavica where Cu has a similar nature as Zn.

Due to investigated results appropriate remediation techniques and/or dredging should be established regarding to sediment monitoring with up-to-date recommendations from the New Serbian Official Regulation that is compliant with the relevant EU recommendations.

References

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The authors acknowledge the financial support of the Provincial Secretariat for Science and Technological Development, Autonomous Province of Vojvodina, Republic of Serbia (114-451 - 323/2015-02), in the frame of The Macro Projects: “The Right to the First Chance”.