TRACE METAL CONTAMINATION OF THE PRAŠNIK RAIN FOREST SOIL AS A CONSEQUENCE OF THE WAR LEGACY

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The Prašnik rain forest is situated in the eastern part of Croatia, close to the Sava River. It had been excluded from an exploatation as early as 1928. Its protection as a special forest reserve owes to a unique composition of approximately 1000 old oak-trees, and some 150 hornbeams and bogues. Oak-trees are 250- to 300-year-old, one of them measuring 7.82 m in diameter, 39.6 m in height, and 50 m^3 in wood weight. The aim of this study was to assess an impact of war in Croatia which was fought 23 years ago, when numerous mines were planted in this region, threatening visitors and scientists still today. Since war activities release tons of contaminants into the environment, the soil trace metal pool was investigated. Ten topsoil (S) samples were taken randomely within a radius of 20 m, immediately behind the danger mine sign. At each site, adjacent vegetation, i.e. cortex (C) and foliage (F), were sampled; the 3 groups constituted 30 samples in total. The study area belongs to the Pannonian Basin, and is composed of crystalline basement underlying the Sava River alluvial and Quaternary siliciclastic sediments. Major and trace metal concentrations in all 3 groups were measured by ICP method. Analysed soils are composed of quartz, muscovite, vermicullite, and albite. Its median values of pH, CEC, LOI, Cd, Cr, Cu, Fe, Mn, Ni, Pb, and Zn were as follows, respectively (metals in mg/kg): 7.06, 16.16 cmol/kg, 7.88%, 0.08, 29.03, 10.22, 20490, 423.26, 15.14, 16.75, and 47.35. All metal values in a sample taken from the ex-mine crater are 2-4 times increased compared to the rest, thus evidencing the negative influence of past war activities on soil composition. Generally, positive statistically significant Kendall's Tau correlation coefficients of trace metals (Cd, Cr, Cu, Ni, and Zn) were found for all combinations of the three sample groups (e.g. Cu (C) – Cd (C) = 0.58, Cr (C) – Cr (F) = 0.50, etc.). These results indicate that the war activity could have played a certain role in a local distribution pattern of soil as well as vegetation trace metal levels.