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Soil geochemistry of ironworks surroundings in Srednja Radovna, NW Slovenia

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Mining and ore procession represent one of the main sources of heavy metals in Slovenia. Consequently we have decided to determine the actual influence of ironworks in Srednja Radovna on soil geochemistry. On the area, which is located 7km northwest from Bled (NW Slovenia), there was an active blast furnace which was used from 16^{th} century till 1901, when activities on the area were finally dissmissed. One of the main motives for the analysis was the fact that the area is located in Triglav national park, where very strict environmental legislation is in force. In addition, the area is poorly geochemically analysed.

Sampling was carried out in the surroundings of former blast furnace and in three square nets with radius 10×10m, 60×60m and 110×110m from the blast furnace as a base point. Samples were also taken from two cross-valley profiles from Pokljuka plateau to Mežaklja plateau and also from areas upwards and beneath the blast furnace, close to the river Radovna. 45 samples were collected and analysed for the oxides of the major elements (SiO_2, Al_2O_3, Fe_2O_3, MgO, CaO, Na_2O, K_2O, TiO_2, P_2O_5, MnO in Cr_2O_3), trace elements (Ag, As, Au, Ba, Bi, Be, Cr, Cd, Co, Cs, Cu, Ga, Hf, Hg, Mo, Nb, Ni, Pb, Rb, Sb, Sc, Se, Sn, Sr, Ta, Th, U, V, W, zn, Zr, Y), rare earth elements (REE) (La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu) and TOT/S, TOT/C, LOI.

Two major areas with different geochemical characteristics can be determined. The

first area is located between the blast furnace and river Radovna. On this area high concentrations of carbonates are present. The second area is on the slopes of Pokljuka and Mežakla plateau. High concentrations of SiO_2, Al_2O_3, Na_2O, K_2O and trace elements appear. Heavy metals (Fe_2O_3, MnO, Zn, Pb, Cu) are concentrated in the area of blast furnace in very narrow areas and with concentrations quite higher from the ones determined as natural values. Concentrations of $P_2O_5$and Hg also show on antopogenic source. The highest concentration of Hg is located in the spot of ex blast furnace.

It is also seen that the distribution of some elements is connected with geomorphology. There are certain trends which clearly show that distribution of the elements depends on the latitude and relief.

Concentrations of heavy metals do not exceed the warning values determined in Slovenian legislation. According to 400 years long industry the level of pollution is small.