

## SULPHUR SOIL POLLUTION CAUSED BY A COAL-FIRED POWER PLANT (PLOMIN, CROATIA)

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Until 25 years ago, a coal-fired power plant in the city of Plomin (Istria, North Adriatic) had used local coal which contained as high as 10% of sulphur (S), and 15% of ash (Valković et al., 1984). The aim of this study was to assess an impact of 43 years of S and fly ash emissions from the plant on soil S pool. Eighteen topsoil samples were taken within radii of 1, 5, and 10 km from the plant, as well as every 100 m along a pollution gradient (PG) in the prevailing wind direction, in a distance (D) 100 m to 1 km from the plant. The study area is karst terrain composed of carbonate rocks, overlain by soil classified as eutri-chromic cambisol. Major and trace elements were measured by the PIXE method. Other analyses included the determination of soil mineral and granulometric composition, pH, LOI, CEC, and CaCO<sub>3</sub> content. The ongoing work is focused on the PIXE analysis of new soil samples taken from wider region of the plant, laboratory-scale toxicity testing to determine the properties of leachates of the soil, and Hg measurements. Previously, Oreščanin et al. (2002) found neither cytotoxic nor mutagenic effects of the Plomin bay sediments. According to Oreščanin et al. (2009), these sediments had identical chemical composition regardless of time of deposition (i.e. prior and following the plant activity). Analysed soils are composed of quartz, plagioclase, muscovite, vermiculite, haematite, and chlorite. Silt and clay size fractions constitute a major portion of soil. Its median values of pH, CEC, LOI, and CaCO<sub>3</sub> were as follows, respectively: 6.8, 25.4 cmol/kg, 22.6%, and 7.9%. As regards the PG samples, their mean, median, min, max, and SD values calculated for S were as follows, respectively (%): 0.88, 0.40, 0.12, 3.28, and 0.98. Sulphur mean is almost twice as high as S value of 0.5% reported for this locality by Miko et al. (2003). Statistically significant Kendall's Tau correlation coefficients of pairs D-LOI, D-S, D-Cu, S-LOI, and S-Cu were as follows, respectively: -0.51, -0.73, -0.60, 0.60, and 0.69. These results evidence a strong trend with distance from the plant, thus indicating that a point source played a major role in a local distribution pattern of sulphur.

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