



Comparison of overbank fines magnetic pollution in the rivers of Czech Republic by using MS/Fe ratio and enrichment factor

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Magnetic susceptibility (MS) normalized to the content of Fe is able to effectively remove the influence of facies (grain-size effect) in determining the background values, as well as Al normalization of heavy metal concentrations. Normalization MS/Fe is also used to determine the contamination of sediments by magnetic particles, using calculation of enrichment factor of magnetic susceptibility in sediments.

In our study, we compared the magnetic enrichment of overbank fines of five rivers in Czech Republic (the Ploucnice, the Morava, the Jizera, the Litavka, and the Berounka rivers).

Magnetic susceptibility was measured using KLY-2 Kappabridge (Agico, Czech Republic) and mass-specific data were expressed in $m^3 \times kg^{-1}$. X-ray fluorescence elementary analysis of powdered sediments was performed by ED XRF MiniPal 4.0 (PANalytical, the Netherlands). ED XRF results were calibrated to ppm values using results obtained from selected samples by ICP MS. Compared samples were taken from lithogenic parts of profiles, unaffected by anthropogenic contamination and pedogenetic and reductimorphic processes.

Results showed high variability of the measured values. In the Litavka and the Morava River sediments were measured low values of MS ($[U+02C2] 150 \times 10^{-9}$) at relatively high contents of Fe ($[U+F07E] 20-45\ 000$ ppm). In contrast, lower flow of the Jizera River showed low Fe contents ($[U+02C2] 12000$ ppm) having MS values in a wide range ($70-800 \times 10^{-9}$). The Ploucnice River and the middle stream of the Jizera River showed wide range of Fe content ($[U+F07E] 1100$ to 34000 ppm) and also of MS ($[U+F07E] 100-530 \times 10^{-9}$). The iron content in the Berounka River showed narrow range between $15-26000$ ppm but the MS values were in the range from 100 to 355×10^{-9} .

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