Magnetic susceptibility and lithological characterisation of the lake sediments from the southeastern Romania wetlands; environmental significances

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The paper is dealing with various cases from the most important wetlands in Romania, *i.e.* the Danube Delta, the Razim (Razelm) - Sinoie lagoonal Complex and the Black Sea Littoral Zone. Based on an original magnetic susceptibility (MS) scale with a "genuine" lithological support (Rădan and Rădan, 2007a) and a MS databank covering three decades of lake sediments investigation (Rădan and Rădan, 2007b), the capability of this magnetic property as a proxy parameter to differentiating lacustrine-deltaic and fluvial-deltaic sedimentary environments is first presented. The former are related to the aquatic ecosystems located inside the Danube Delta (DD) interdistributary area, while the latter are merged with the main DD Branches. Enviromagnetic fingerprints are recovered from the bottom sediments sampled in dynamic and confined aquatic environments and their intensities are evaluated and compared.

Other examples concern the MS characterisation of the sedimentary environments belonging to a particular unit, a lagoon system (*i.e.* the Razim - Sinoie Lagoonal Complex/RSLC), isolated from the Black Sea, but linked with the Danube Delta. The k maps drawn for two main lakes from the RSLC, taking into consideration each of the 3 separated beds ("a", "b" and "c") and the whole sampled "sediment packet" ("a+b+c"), agree with the corresponding lithological maps. The sedimentary areas that are characterised by higher k values in the MS maps are coincident with the areas pointed out by the detrital/siliciclastic component distribution map. Higher MS values are recorded for the main channel inlets into the Razim Lake. The k maps show good connections between the higher intensity magnetic signatures and the submerged prolongation of the surrounding sand ridges.

As regards the sedimentary environments of the Black Sea Littoral Zone, the MS results obtained for a fluvio-marine liman (*i.e.* Tasaул Lake) have been analysed. The highest k values, matching the anomaly recorded in the detrital component map, were measured in the main stream inlet into the lake, while the lowest k values cover its central zone, where the organic matter-rich sediments are mainly present.

A parallel analysis of the k values and of the main lithological components (*i.e.* organic/TOC, carbonate/CAR and mineral-siliciclastic/SIL, respectively) that characterise the sedimentary deposits is carried out for the deltaic, lagoonal and littoral lakes. The connection between the MS regime recorded within the lake sediments and the ternary diagrams showing their lithological classification (*i.e.* detrital fraction, carbonate fraction and organic matter) is discussed, as well.

Distinguishing features identified between various lakes are clearly reflected by the investigated enviromagnetic parameter (MS). The modern sediments sampled in various aquatic environments stand for high fidelity enviromagnetic archives, which are deciphered within the presented case studies.

**Key words:** environmental magnetism, magnetic susceptibility, lithology, lake sediment, Danube Delta, Razim - Sinoie Lagoonal Complex, Black Sea Littoral Zone.

**References**
