

Magnetic fabric of anthropogenic ash horizons in cave sediment succession

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Rock magnetic and magnetic fabric study has been elaborated on the anthropogenic ash horizons in Crvena Stijena (‘Red Rock Cave’ , Montenegro) sediment succession. The study has multiple goals including the identification of mineral forming during burning, alteration after the fire, revelation of the magnetic fabric and its significance in the characterization of cave facies.

Magnetite has been identified as a main ferromagnetic magnetic component of the ash. In addition, a ‘recently unknown’ contributor(s) was found by thermomagnetic experiments (Variable Field Translation Balance - VFTB, Mag Instruments UG, Germany). Various type of minerals are the candidates, such as SD magnetite, siderite and greigite. The forming of all candidates can be described by various processes in cave environment, including burning, post-burning alteration, precipitation from groundwater and so on. But no any theory is supported fully by the rock magnetic results.

The magnetic fabric of the ash was characterized by low field anisotropy of magnetic susceptibility measurements (AMS; KLY-4S Kappabridge, AGICO, Czech Republic). The statistical analysis (Whisker’ s box plot) of the basic anisotropy parameters, such as foliation, lineation, degree of anisotropy and the shape parameter, along with the alignment of the principal susceptibilities on stereoplots, revealed varied characteristics of the ash units. The diverse, oblate to prolate, lineated or strongly foliated, horizontally oriented and inverse fabrics of the units like the magnetic contribution. It may indicate multiple processes (on slope), such as orientation by gravity, solifluction, run off water, quasi-vertical migration of groundwater and post-burning/post-depositional alteration of the fabric by the impact of a rockfall (Figure 1).

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