Geological importance of paleokarsts and neptunian dykes in the Lower Jurassic rocks at the Beytepe village-Çayyolu area (South west Ankara, Turkey)

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The geometric pattern of paleokarsts and the depositional characteristics of their laminated fillings and the development of the Neptunian dykes in Lower Jurassic microbialitic limestone in the study area located 14 km south west of Ankara were investigated by using field observations and examining polished rock slabs and acetate peels.

There are several cross cutting paleokarsts developed several karstification phases in shallow marine limestone of the Bayırköy formation in the study area (Deli 2005). The voids of karsts were filled with pink, laminated pelloidal marine sediments. A few disconformities were observed among laminae in sediments filling the karstic voids. The synsedimentary Neptunian dykes coexist together with karstic voids and were filled with the same sediments. In the study area, crinoidal facies with erosional base overlies the microbialitic limestone. Large Neptunian dykes, up to 3 meters, were developed at the upper part of the facies and were filled with red colored mudstone of the Ammonitico Rosso facies (Lower Toarcian, Alkaya and Deli, 1998). Multiphase karstic features developed in the Sinemurian microbialitic limestone point that the area were exposed to the atmosphere more than once (Jimenez de Cisneros *et al*., 1991) Laminations developed in different lineations and dipping of a single paleokarstic filling and irregularities among laminations as well as the presence of Neptunian dykes prove that seismic activities were repeated within short periods. Especially the presence of large Neptunian dykes beneath the Ammonitico Rosso facies which is typical for deposits of the Pelagic carbonate platforms (PCP ; Santantonio, 1993) implies that this facies were deposited in a shallow marine pelagic environment resulted from synsedimentary faulting in the area.

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Non-conservative behaviour of molybdenum in coastal waters

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Introduction

Molybdenum is the most abundant trace metal in ocean water and generally displays a conservative behaviour unaffected by biological activity. However, several authors observed deviations from conservative behaviour, which they attributed to scavenging by MnO_x phases, utilisation by plankton, and complexing by organic particles (Head & Burton, 1970; Berrang & Grill, 1974; Yamazaki & Gohda, 1990; Tuit & Ravizza; 2003). In this contribution we postulate a conceptual model for non-conservative behaviour of Mo in coastal waters, which is based on the tight coupling of geochemical, biological, and sedimentological processes (Dellwig *et al*., 2007).

Results and Discussion

Non-conservative behaviour of dissolved Mo was observed during specific time periods in coastal waters of the Southern North Sea. In July 2005 a loss of about 60% of Mo_{diss} was observed within 36 hours. In contrast, in August 2002 Mo_{diss} revealed a tidal cyclicity with maximum values up to 158 nM at low tide. The decrease in Mo_{diss} was accompanied by Mo enrichments on SPM. Parallel to decreasing Mo_{diss} concentrations Mn_{diss} showed an increasing trend while Mn_{part} decreased. Such finding is compatible with the formation of oxygen-depleted zones in aggregates, which provide suitable conditions for the rapid fixation of Mo and parallel release of Mn by chemically and/or microbially mediated processes. This assumption is supported by biological and sedimentological parameters. The production of organic components (e.g. TEP) during breakdown of an algae bloom in July 2005 led to the formation of larger Mo-enriched aggregates, thus depleting the water column in Mo_{diss}. After deposition on and incorporation into sandy tidal flats these aggregates are rapidly decomposed by microbial activity. Pore water profiles document that during microbial decomposition of these aggregates, substantial amounts of Mo are released and may replenish and even enrich Mo in the open water column as seen in August 2002.

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