

The abrupt installation of the euxinic environment as reflected by the unconsolidated sediments of the western slope of the Black Sea off the Romanian shore

Octavian G. Duluu (1,2), Gheorghe Oaie (3), Ana-Voica Bojar (4,5), Inga Zinicovscaia (2,6), Otilia-Ana Culicov (2,7), Marina V. Frontasyeva (2), and Janet Gradinaru (8)

(1) University of Bucharest, Structure of the Matter, Earth and Atmospheric Physics and Astrophysics, Magurele (Ilfov), Romania (o.duluu@upcmail.ro), (2) Joint Institute for Nuclear Research, Frank Neutron Laboratory, Dubna, Russian Federation, (3) National Institute for Marine Geology and Geoecology, Bucharest, Romania, (4) University of Salzburg, Department of Geology and Geodynamics, Salzburg, Austria, (5) Mineralogy, Studienzentrum Naturkunde, Graz, Austria, (6) National Institute for Physics and Nuclear Engineering - Horia Hulubei, Bucharest, Romania, (7) National Institute for Research and Development in Electrical Engineering, Bucharest, Romania, (8) ArcelorMittal Galati Steel Company, Galati, Romania

A 4,5 m long core containing unconsolidated sediments collected at a depth of 500 m on the western slope of the Black Sea, off Romanian shore was analyzed by Computed Tomography (CT), X-ray Diffraction (XRD), X-ray Fluorescence (XRF) and Instrumental Neutron Activation Analysis (INAA) in order to investigate the changes in the Black Sea environment during the past 10.5 – 12 ky.

The most relevant information regarding unconsolidated sediments was furnished by the CT images, clearly indicating the moment when the euxinic environment settled on this sector of the Black Sea, presumably 2.7 ky ago. This event is represented by the sedimentation of a coccolithic mud consisting of alternation of dark and light thin laminae composed of terigenous and respectively coccoliths rich material. This type of mud is characteristic for the sedimentary unit 1, filling the uppermost 50 cm of the core.

The observation was confirmed by subsequent XRF and INAA determinations, which show a high content of calcium carbonate related to accumulation of *Emilliana huxley* coccoliths as well as of minor elements such as iron, molybdenum and uranium, a typical characteristic of euxinic environment. For instance, the average content of Mo and U is 28 and respectively 4 time higher than the corresponding content of the Upper Continental Core (UCC), while the Fe/Al ratio is around 0.52. Moreover, the average chondrite normalized Ce content of sedimentary unite 1 is 1.37 ± 0.17 , slightly higher than 1.22, the characteristic value for the UCC. The Ce data indicate a weak positive anomaly, characteristic also for an euxinic reducing environment.

All these investigations confirm the abrupt installation at a depth of 500 m of an euxinic environment on the western slope of the Black Sea, euxinic environment persisting to present time.