

A high resolution elemental record of Lake Bafa sediments (Turkey)

B. YALAMAZ^{1*}, Ö. BULKAN², M. N. ÇAĞATAY¹ AND D. ACAR¹

¹Istanbul Technical University, Geological Engineering Department and EMCOL Research Centre, Istanbul, Turkey

²Istanbul University, Geological Engineering Department, Avcilar, Turkey

An ITRAX X-ray fluorescence (μ -XRF) core scanner has been applied for sediment geochemistry investigations. Investigated core section (Baf 37: 4.2m) was collected from Lake Bafa, which is a significant inland lake system in Eastern Mediterranean Region, covers the geological archive of the last 2300 years. Geochronological data were produced using Accelerator Mass Spectrometry method. Additional informations were also produced applying Shimadzu Analyser for total organic carbon (TOC) and inorganic carbon (TIC) fractions and particle size analysis.

Chemo-stratigraphical properties of the sediments are defined in respect to the fluctuations of 30 variables (Al, Si, P, S, Cl, Ar, K, Ca, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Br, Rb, Sr, Y, Zr, Rb, Mo, Ba, Pb, Th, U). Time dependent variations of external (transportation pathways and intensity) environmental conditions are determined by selected parameters. In accordance obvious fluctuations of the element trends, rapid mass-flow events would be suggested. These mass-flow events were mainly accumulated during the 1100 to 2300yr BP period. These characteristic phases reflect individual sedimentological, chemical and paleontological signals. Typical sedimentological characteristics are mainly identified as the coarseness of the grain size distributions (fine sand and coarse silt). Simultaneous enrichment of lithophile elements (K, Si, Ti, Rb), depletion of TOC and Ca contributions were observed. Cardium sp. shells are also recorded in the lower parts of the core section Baf37 (2- 4.2m), were probably transported from the Aegean Sea during these phases of high energy environment. Contrarily, enhanced TOC contributions, Ca values, low amounts of coarse clastic materials and absence of marine microfossils indicate subsequent phases of stable inland environmental. Contemporarily sediments accumulation during such stagnant lake/lagoon phases, indicate lithophile element trends with moderate values.

This study is supported by the TUBITAK with the project number of 113Y070 and Istanbul University research fund (project number of 28942 and 17828).