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Dynamics of Late Quaternary sapropel periods documented by micropaleontological and sedimentological data from North Aegean Sea

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Located at the interface of the mid/high latitude climate system and affected by the North Atlantic Oscillation and the monsoonal system over Africa, the Mediterranean Sea has a unique potential to record the occurrence and phasing of climatic changes in both systems. In particular, the eastern Mediterranean Sea is more sensitive and faster responding to external forcing than the open ocean due to smaller size and partial isolation. A manifestation of the high sensitivity of the eastern Mediterranean sedimentary environment to climatic forcing is the periodic deposition of dark colored and organic matter rich sediments, termed “sapropels”. In particular their formation is closely correlated with the reduction in ventilation, due to low salinity surface water layer, leading to anoxia at the bottom and preservation of organic matter, and/or the increase in primary productivity in the photic zone. To address which factor is more responsible for the sapropel’s formation, a high-resolution study of planktonic foraminiferal abundances in two cores from North Aegean was carried out. Their response reflects the essential information about the paleoceanographic evolution in the water column in terms of stratification and productivity during the different sapropel events covering the last 90 kyrs. Cores M 22-67 and M22-68 were recovered from the water depths of 175 and 305 m respectively in the Chios Basin (North Aegean Sea). Both cores approximately span the last 90 ka, exposing the most recent S1 and the older S3 sapropels. They particularly exposed at very high resolution compared to most occurrences throughout the eastern Mediterranean, because of the highest sediment accumulation rates occurred in the study basin. Application of this information to the study hemipelagic sediment cores, through the planktonic foraminiferal analyses, suggests that we further contribute to existing evidence of climatic instability during sapropel deposition in eastern Mediterranean Sea. Moreover, using sedimentological observations, we aim to determine the dynamics of sediment delivery, redox conditions and preservation during the formation of these sapropel events.