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Major ecological changes in the eastern Mediterranean during the last interglacial sapropel S5

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Sapropels reflect periods of widespread deposition of organic-carbon in the eastern Mediterranean (eMed) in response to positive shifts in the freshwater budget of the basin driven by distinct minima in the precession cycle. The last interglacial sapropel S5 is intensively developed and might hold excellent potential for high-resolution studies. This is essential to track the major changes that led the eMed thermohaline circulation to its sapropel mode and, in turn, to the major ecological changes developed throughout the water column. However, a lack of Aegean S5 records has so far limited our understanding of the ecological implications of the dramatic physical and chemical changes that occurred in the water column in a region of current deep convective overturning.

Here we present the first systematic high-resolution multi-proxy study of an extremely organic-rich (up to 14% Corg) sapropel S5 from the Aegean Sea (core LC21) and discuss it in the context of previously described contemporaneous records from key locations in the open eMed. Our results unequivocally support the previous notion that the increased runoff (160-300% greater than today), largely discharged into the open eMed along the North African margin, forced the anoxic event with profound oceanographic reorganizations throughout the basin. The Aegean subsurface circu-

lation collapsed shortly after the onset of the freshwater flooding, as indicated by the sudden disappearance of benthic fossils and major increase in the organic carbon accumulation. In a few centuries, the occurrence of large amounts of isorenieratene marks the development of euxinic conditions – hostile to aerobic life – throughout the Aegean water-column up to 200 m or shallower. In addition, the massive occurrence of organic-walled cysts of the red tide forming and potentially toxic euryhaline dinoflagellate *Pyrodinium bahamense* in the Aegean Sea and over the entire eMed during S5 reveals extreme ecological conditions at the top of the photic zone.

These findings suggest that substantial changes in the hydrological forcing over the eMed affect vertical stability of the water column as far as the Aegean, and, in turn considerably modify the ecological features of the entire water column throughout the basin.