



The distribution of demethylated sulphur species (DMSSx) in the Eastern Mediterranean Sea: the summer paradox in the South Aegean Sea

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Seawater concentrations of the dissolved fraction of dimethylsulphide (DMS) and related compounds, demethylated sulphur species (DMSSd), have been measured on an inter-annual basis in the Eastern Mediterranean Sea. More specifically, the current study presents a significant dataset with spatial and temporal trends on the distribution of DMS, dissolved dimethylsulphoxide (DMSO) and dissolved dimethylsulphoniopropionate (DMSPd), as well as depth profiles from the upper layer in the North and South Aegean Seas. All DMSSd measured showed temporal and spatial variability, while DMSPd and especially DMS showed higher concentrations in the South Aegean Sea, opposite to what it would have been expected based on the highly oligotrophic character of the region. Seasonality of DMSPd was not as pronounced as in the case of DMS. Vertical profiles of DMS indicated clear seasonal variability with increased concentrations during late spring and to a smaller extent during early fall. DMSO also exhibited seasonal variability with maximal values appearing in the summer and early fall; most likely photoxidation into DMSO forms a significant sink for DMS in the area. No correlations were found between any of the species investigated and chlorophyll a concentrations or primary productivity measurements. DMS/Chl a ratios from the South Aegean Sea demonstrate the so-called summer paradox case, where the opposite trend in DMS and Chl a concentrations appears, with the ratio reaching maximal values. DMS maximum concentrations coincide with the annual minimum in chloro-

phyll *a*/ phytoplankton pigment concentrations, a seasonal trend that has previously been reported in the Western Mediterranean and Sargasso Seas. The most eligible candidate responsible for the observed trends in DMS at minimum Chl *a* concentrations would be a heterotrophic bacterial population that drive the DMSP degradation pathway towards producing DMS. This speculation however still remains to be investigated. The Eastern Mediterranean Sea has received little attention with respect to the distribution and likely emission of DMS. So far, limited data has become available to the scientific literature, involving biogenic sulphur compounds in the area; making the current study an important stepping stone when the fate of DMS emissions in response to the current and future climate change comes into question.