



## **Early Messinian aragonite event reveals high salinity variability prior to the “Messinian Salinity Crisis” (Late Miocene) in the Mediterranean region**

**T.C. Brachert** (1), F.R. Bosellini (2), M. Reuter (1,3), A. Vescogni (2), R. Mertz-Kraus (1)

(1) Institut für Geowissenschaften, Johannes Gutenberg-Universität Mainz, 55099 Mainz, Germany, (2) Dipartimento del Museo di Paleobiologia e dell’Orto Botanico, Università di Modena e Reggio Emilia, Via Università 4, 41100 Modena, Italy, (3) present address: Institut für Geowissenschaften, Universität Graz, Österreich

The early Messinian deep-water record of the Mediterranean region reveals increasing evidence of significant salinity stress prior to the Messinian salinity crisis (MSC). In shallow reef environments such a pattern has not yet been documented, however, the palaeoecological interpretation of some sedimentary components, such as stromatolites in coral reef frameworks, remains ambiguous. We present stable isotope data from early marine carbonate cements in open and semi-restricted settings of southern Italy and Greece (Crete). Consistently,  $\delta^{18}\text{O}$  compositions of marine cements translate into sea surface salinity (SSS) of 50 to 60‰, certainly too high for most members of the shallow water carbonate factory (i.e. zooxanthellate corals, echinoderms...). We suggest, therefore, that recurrent events of high salinity have occurred causing events of community replacement ending up in “abiotic” episodes. These events, however, were too short to be recorded as discrete beds in 4<sup>th</sup> order depositional sequences by effective time-averaging. Because the cements reflecting high salinity occur equally in intertidal and reefal slope facies, salinity build-up was not linked to evaporative draw-downs of sea level. Such a scenario fits concepts of the MSC starting synchronously over the entire Mediterranean as a deep brine pool.