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Paleoenvironmental changes at the Miocene-Pliocene Boundary in the Mediterranean from high resolution studies along a West-East transect

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The deposition of the Messinian evaporites ended in the whole Mediterranean area by an episode of brackish environment (the so-called Lago-Mare), before the rapid restoration of open marine conditions in the earliest Zanclean. A multidisciplinary study of the upper Messinian-lower Zanclean (biozone MPl1) sedimentary interval has been carried out using a high sampling resolution along a W-E Mediterranean transect from southern Spain, Balearic basin (ODP Site 975b), Tyrrhenian basin (ODP Site 974), Sicily, Zakynthos, Corfu, Crete, including previous data obtained in Morocco and the Levantine Basin (Cyprus and ODP Sites 968 and 969). All the studied sections have been correlated using planktonic foraminiferal assemblages, sedimentological and stable isotope variations. In addition, the Messinian/Zanclean transition in the Eraclea Minoa section from Sicily has been re-examined with a continuous sampling each centimetre across the boundary.

Strong variations of $CaCO_3$ content, oxygen and carbon stable isotopes of carbonates and foraminiferal assemblages can be correlated between the different studied sections. The uppermost Messinian deposits are barren of fossils or characterized by only reworked planktonic foraminifera, except for the sporadic presence of *Ammonia beccarii tepida*, ostracods and brackish mollusks. The bulk carbonate oxygen and carbon isotopic compositions usually exhibit large variations with dominant negative values indicating huge freshwater dilution. The basal Pliocene deposits (MPl1) biozone dis-

play a rapid and progressive increase of the isotopic values and the progressive re-colonisation by marine fauna. Thus, the restoration of open marine conditions was a sharp but progressive event recorded throughout the whole Mediterranean. During a very short transitional period, the inflowing sea water was mixed with the Lago-Mare brackish or fresh waters and the planktonic foraminifers carried by sea water hardly survived in such still unstable marine conditions. Deep water conditions were restored rapidly without erosional boundary except in some marginal basins where the marine waters flowed on an erosional surface (Crete, Morocco) and the earliest Pliocene deposits are represented by molluscs-rich shallow benthic macroorganisms associated to *Lithophaga* boring activity (Morocco). Normal and stable marine conditions were established definitely one precession cycle after the re-opening of Atlantic connections.