

URANIUM-SERIES AGES OF FOSSIL CORALS FROM MALLORCA, SPAIN: THE "NEOTYRRHENIAN" HIGH STAND OF THE MEDITERRANEAN SEA REVISITED

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Abstract

The emergent marine deposits of the Mediterranean basin have been recognized as an important record of Quaternary sea level history for more than a century. Previous workers identified what have been interpreted to be two separate high stands of sea in the late Quaternary, namely the "Eutyrrhenian" (thought to be ~ 120 ka) and the "Neotyrrhenian" (thought to be either ~ 100 ka or ~ 80 ka). On Mallorca, Spain, both of these named deposits lie close to present sea level, implying paleo-sea levels slightly above present during both marine isotope stages (MIS) 5.5/5e and either 5.3/5c or 5.1/5a. If these interpretations are correct, they conflict, at least in part, with sea level records from far-field localities. We analyzed corals from the Neotyrrhenian beds on Mallorca, which gave U-series ages from ~ 126 ka to ~ 118 ka. These ages are consistent with previously published amino acid data that show that the Neotyrrhenian and Eutyrrhenian deposits are not significantly different in age. A fossil molluscan fauna from the Neotyrrhenian deposits on Mallorca has a warm-water paleozoogeographic aspect, with nine southward-ranging species and four extralimital southern species. When compared with sea surface temperatures obtained from planktonic foraminifera and alkenones from ODP core 977 in the nearby Alboran Sea, the only time period that shows comparable warmth is MIS 5.5/5e, consistent with the U-series ages of corals from the Neotyrrhenian deposits. We propose that the Neotyrrhenian deposits are a beachrock facies of the same age as the Eutyrrhenian deposits. This interpretation is consistent with the differences in physical sedimentology of the two deposits, explains the U-series and amino acid data indicating the same age, is consistent with the very slight elevation difference of the Neotyrrhenian and Eutyrrhenian beds, and explains the similar, though not identical paleozoogeographic aspects of their fossil faunas.