



[U+F0A7] Interplay between tectonics and eustasy on an uplifted Plio-Pleistocene marine sequence on Zakynthos island, Eastern Mediterranean.

M.D. Papanikolaou (1), M. Triantaphyllou (2), M.J. Head (4), E. Platzman (3), and P. Gibbard (1)

(1) (mp350@cam.ac.uk) Department of Geography, University of Cambridge, Cambridge, UK, (2) (m.triant@geol.uoa.gr) Faculty of Geology & Geoenvironment, Dept. of Historical Geology-Paleontology, University of Athens, Athens, Greece, (3) (platzman@usc.edu) Department of Earth Sciences, University of Southern California, United States, (4) (mjhead@brocku.ca) Department of Earth Sciences, Brock University, St Catharines, Ontario, Canada

The interplay between tectonics and eustasy is investigated in the Plio-Pleistocene marine deposits on Zakynthos island, Ionian Sea, Eastern Mediterranean based on biofacies analysis. The sequence comprises three formations among which the two older are marl-dominated but are separated by a low-angle unconformity followed by the deposition of calcarenites. The third and uppermost formation which follows an angular and erosional unconformity consists of calcarenites. The age model for the Zakynthos sequence is constrained by the identification of the palaeomagnetic reversals of Matuyama/Brunhes chrons, the top and bottom of the Jaramillo Subchron, and top of the Olduvai Subchron, and by nannofossil biostratigraphy. These are used for correlation of the Zakynthos sequence with ODP Holes 963 A/B, off Sicily, while a finer tuning of the Zakynthos age model is accomplished by correlating the magnetic susceptibility logs and the isotope record from Site 963, and subsequently by testing the dinocyst-derived temperature index to the isotope record. The dinocyst record together with some nannofossil and ostracod indications, and lithostratigraphic features are employed for the sequence stratigraphic and palaeoenvironmental reconstruction of the Zakynthos section.

Tectonics seem to be the primary configurative force for the Zakynthos sequence, where uplift supersedes subsidence and at the same time glacio-eustasy amplifies or reduces the tectonic effect. So, despite the strong control of tectonics in shaping the sedimentary edifice of the sequence, the climatic imprint is clearly present. Lithostratigraphy does not a priori reflect cold or warm intervals, since both marls and sandstones seem to have been deposited during both of these intervals. The magnitude of the two unconformities in the sequence seems to relate to the global glacio-eustatic reconstructions. Therefore, the upper unconformity, which correlates to MIS 12, is clearly more significant than the lower unconformity that equates to MIS 22, the hiatus of which is estimated at an average value of 30 kyr and varying between 5 and 65 kyr. Comparing the Zakynthos sedimentary succession of alternating sandstones and clayey silts to the global cycle chart (SEPM Sequences, 2004) it shows that it might respond to a fourth-order 200-kyr cyclicity if the most favoured age model of the sequence is adopted. Therefore, while the 4th-order cycles (0.5–0.1 myr) are probably represented the 5th- and 6th-order cycles (20 kyr and less) are not expressed in the lithostratigraphy. The construction and comparison of different age model scenarios of the sequence to the global cycle chart displays the importance of a firm age constraint of a sedimentary succession in sequence stratigraphic interpretations.