Geophysical Research Abstracts
Vol. 20, EGU2018-17583, 2018
EGU General Assembly 2018


# Dynamics of benthic marine communities across the Early-Middle Pleistocene boundary in the Mediterranean region (Valle di Manche, Southern Italy): biotic and stratigraphic implications

Daniele Scarponi (1), Veronica Rossi (1), Michele Azzarone (1), Luca Capraro (2), Costanza Faranda (3), Patrizia Ferretti (4), and Patrizia Macrì (5)

(1) Dipartimento di Scienze Biologiche, Geologiche e Ambientali, University of Bologna, Piazza di Porta San Donato 1, I-40126 Bologna, Italy, (2) Dipartimento di Geoscienze, University of Padova, Via G. Gradenigo 6, I-35131 Padova, Italy, (3) Dipartimento di Scienze, University of Roma Tre, Largo San Leonardo Murialdo 1, 00146 Roma, Italy, (4) Consiglio Nazionale delle Ricerche, Istituto per la Dinamica dei Processi Ambientali (CNR-IDPA), Via Torino 155, I-30172, Venezia Mestre, Italy, (5) Istituto Nazionale di Geofisica e Vulcanologia, Via di Vigna Murata 605, I-00143 Roma, Italy

The Valle di Manche (VdM) section (Calabria, Southern Italy) offers the opportunity to investigate the ostracod turnover along a continuous shelf succession straddling the Early-Middle Pleistocene boundary, and compare it against other paleoenvironmental (i.e. mollusks) and paleoclimatic (Uvigerina peregrina $\delta$18O) records. High-resolution (ca. 1 sample/meter) ostracod fauna quantitative data, coupled with gradient analyses (Detrended Correspondence Analysis and nonmetric Multi-Dimensional Scaling), document a strong relationship between changes in faunal composition and lithofacies vertical stacking patterns. The comparison between the mollusk- and ostracod-derived ordination data demonstrates that the meio- and macro-faunal turnover is guided by a common complex gradient: bathymetry. The integrated ostracod-mollusk gradient analysis also provides a trend in water depths along the section, highlighting to what extent such multivariate approach can improve the paleoenvironmental and sequence stratigraphic interpretation of ancient shallow marine successions. When plotted stratigraphically, ordination major axis sample scores reveal two increasing-decreasing patterns in water paleo-depth that fit well with the T-R cycles previously identified. Paleobathymetric estimates combined with the vertical distribution of key ostracod groups (i.e. epiphytic taxa on sandy substrates vs. deep-sea mud lover taxa) allow refining depositional trends, stratal stacking patterns and position of previously not well resolved sequence stratigraphic surfaces within each T-R cycle (e.g., Transgressive Surface-TS). Indeed, two rapid increases in water depth values mark the TSs that separate shallowing-upward, progradational (RST) from deepening upward, retrogradational (TST) stratal stacking patterns of shelf deposits. The TSs, which underline fine-grained successions dominated by deep-sea mud-lover taxa, are invariably constrained to the inception of interglacials Marine Isotope Stages (MIS) 21 and 19, identified within the VdM section by benthic foraminifera $\delta$18O values. Within both the VdM T-R cycles, the deepest conditions (ca. 140 m of water depth) are invariably identified within the Neopycnodonte unit, slightly above of the lightest $\delta$18O intervals. The overlying decreasing bathymetric trend, coupled with shifts in ostracod ecological groups, allows to identify in the bryozoans lithofacies the stillstand+falling of the relative sea-level, also tracked by a progressively heavier $\delta$18O record. More stable paleobathymetric conditions (around 40-45 m of water depth) characterize the overlying silt-sand deposits dominated by epiphytic species and showing the heaviest $\delta$18O values.